

Aircraft *interiors* INTERNATIONAL

2014 SHOWCASE

THE INTERNATIONAL REVIEW OF AIRCRAFT INTERIOR DESIGN AND COMPLETION



2014 SHOWCASE

THE NEW BENCHMARK

The RECARO economy class seat CL3710



The new RECARO CL3710 long range seat gets top marks when it comes to weight, comfort and design. This seat combines outstanding customization possibilities with a list of industry pioneering features.

Less weight: Designing the CL3710, the RECARO team carefully analyzed every component from the engineering, material and manufacturing aspects to arrive at the lowest possible weight. This effort resulted in a per passenger seat weight less than 12 kilograms making it the lightest in its class.

More comfort: The CL3710 offers the maximum shin clearance at seat pitches starting at just 29 inches. The newly designed head rest offers an exceptionally wide range of adjustability both in height and width, complemented with an extra neck support adjustment creating superior comfort. In addition, the extremely narrow and tapered armrests offer optimal hip space.

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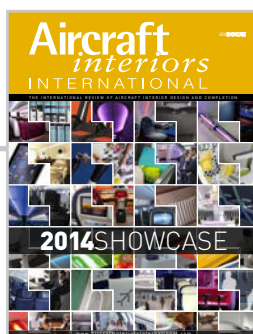
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boomtimes

It has been yet another great year in the aircraft interiors industry, with some major launches and announcements. As a reader of *Aircraft Interiors International* magazine, you will be familiar with the big airline stories of 2013, such as the new Singapore Airlines, JetBlue and British Airways cabins. Let's look instead at projected orders for aircraft – the very lifeblood of the interiors industry.

In its *Global Market Forecast*, Airbus projected that, due to air travel gaining in popularity in all parts of the world, air traffic will grow by 4.7% annually over the next 20 years. This means that 28,350 new passenger aircraft – worth US\$4.1trn – will be required between now and 2032. The airframer has estimated that 10,400 of the new aircraft will be replacements for less efficient, older versions, so with today's aircraft fleet standing at 17,740, by 2032 the worldwide fleet will double to nearly 36,560 aircraft.

Meanwhile, over in Seattle, Boeing has also been making some calculations. The Boeing team found in their *Current Market Outlook* that 2012 passenger traffic rose 5.3% from 2011 levels, and they expect that growth to continue at 5% per year over the next 20 years. This estimate, a little bolder than that of Airbus, creates a forecast of aircraft demand reaching 35,280 by 2032, valued at some US\$4.8trn, with 14,350 of them replacing older, less efficient aircraft. Furthermore, Boeing estimates that around 24,670 of new aircraft deliveries (70%) will be single-aisle, reflecting the growth in emerging markets, and the continued expansion of low-cost carriers around the world. Widebody share is also projected to increase, from 23% in today's fleet to 24% in 2032, with around 8,590 new widebody aircraft delivered.

These are incredible figures, and are great news for cabin designers, the cream of whom are featured in this showcase. Just think of

all the new airlines that will emerge, keen to exploit the new routes being created in developing regions, and all wanting to differentiate their product – which is where the design agencies come in. Their work involves so much more than just styling, so much more than just industrial design even – it can translate an airline's brand into a stylish, comfortable and profitable cabin, and take the ideas beyond the aircraft and apply them across the entire passenger experience.

Those designs are of course aided and enabled by an innovative and expanding supplier base. Another statistic from the year? IMS Research forecast that shipments of commercial aircraft seats will almost double over the next decade, rising from 2012's 430,000 seats, to 840,000 in 2022. Further, Research and Markets predicts that the global commercial aircraft interior market will be worth US\$12bn by 2016 – up from US\$8.4bn in 2010.

The IFEC sector is also booming, with incredible advances being made. Indeed a technological leap was announced earlier this year when inflight connectivity giant Gogo revealed that it intends to launch Gogo GTO (Ground to Orbit), a hybrid technology that combines the best aspects of existing satellite technologies with Gogo's Air to Ground (ATG) cellular networks. The result? A potential capability of more than 60Mbps being delivered to the aircraft. Love it or hate it, you will soon be able to do just as much work in the air as on the ground.

All amazing, but the most amazing thing about the figures that emerged in 2013 isn't the surge in aircraft orders, the new profit-creating routes, the rise in demand for elegant cabins, or the remarkable technologies. It's much simpler than that: millions more people will soon be experiencing the wonder of flight for the first time. And you can't put a figure on that kind of experience.

Adam Gavine, editor

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"Drawing inspiration and insights from other industries and experiences is valuable and can lead to breakthroughs. Being too inward-looking can be limiting"

PAUL EDWARDS, HEAD OF INDUSTRIAL DESIGN, AIRBUS, PAGE 6

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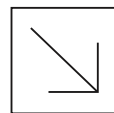
process makes perfect?





Design managers sometimes get a bad reputation for stifling rather than facilitating, but the good ones really do know how to harness creativity to deliver results. Previous experience of juggling schedules and massaging egos is preferable...

GUY BIRD, AIRCRAFT INTERIORS INTERNATIONAL



Do you know the joke about the designer changing light bulbs? It's an oldie but a goodie, and if you haven't heard it before, here it is: Question: "How many designers does it take to change a light bulb? Answer: "Hmmm [cue much chin-scratching]... I don't know. What do you think?"

The joke plays on the stereotypical idea of a designer being unable to even start the job because his or her mind is too busy thinking rather than doing. But however clichéd it may be, the fact that every designer I've ever told the joke to laughs out loud in recognition, suggests that the management of designers and the design process is perhaps a more complicated process than looking after some other professional disciplines, and requires a certain finesse to get the job done without stifling the all-important creative input in the final outcome of the product or service.

It's a situation new design director at British Airways, Richard Stevens, recognises well: "Designers are notoriously bad at making decisions and sticking to them, and rightly so: they want to continue to affect and resolve what they've created. But actually it's about prioritising the battles you need to fight, and where to invest that effort based on what customers want, but they don't know they want."





01

01. The belief at ZEO's studio is that industrial design, prototyping and engineering should have equal roles
02. ZEO staff believe that to be immersed in the design process, a design house must be part of an OEM

Any design job requires input from other parts of a business, whose employees may use different parts of their brains and thus approach challenges and solutions differently too. Logically then, a good design manager must be both a champion of the design department to those other departments, and a negotiator in both directions regarding the inevitable constraints that may affect the process and final outcome.

How should a business set up to facilitate great design then? Most experts we spoke to agreed that while some built-in flexibility for designers to think freely is a good thing right at the start of a project, a well-defined outline brief is still crucial. Monika Zych, the Los Angeles studio director for BMW Group DesignworksUSA, explains how the multidisciplinary design business she works for goes about things. "Each design programme typically includes a creative director, project manager and a core design team, which can be comprised of both generalists and specialists," Zych begins. "As part of our regular internal review process, we establish quality circles. These are

informal review sessions where the design team, creative leadership and other Designworks family members outside of the project evaluate and discuss progress. These quality circles not only provide a dialogue platform for our creative leadership team to support and enable the design team, but also allow for lateral input to be infused into the creative process. Each project is kicked-off with an internal quality circle, where the identified design team, creative leadership and designers outside of the project set the criteria and benchmarks for the programme."

It all sounds like lovely and particularly rose-tinted business-speak in places – especially the reference to work colleagues being 'family' – but where's the creativity allowed to flourish? Zych clarifies: "During such [early] meetings, we find it beneficial to provide the designers with access to all available details and information. Core information is pulled to the surface and communicated, but we find that our creatives find nuggets and inspiration from different sources. Information is key to creativity. Concurrently, we have an internal design and creative



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INVOLVING AN OUTSIDE DESIGN AGENCY
BRINGS POTENTIAL EXTRA CHALLENGES
IN TERMS OF MANAGEMENT ”

02



03

leadership initiative called Design Courage, where we challenge our designers to take risks, change their frame of reference, think bold, create the unexpected and reinterpret past and future meanings.”

In the context of the airline industry, the carrier's design department will often involve an outside design agency (or indeed multiple agencies), which brings potential extra challenges in terms of management. Lufthansa is well used to this way of doing things. As Dorothea von Boxberg, its director of passenger experience design for business and premium, spells out, if the brief is clear, the right beginning tends to follow through to a beneficial ending. “At Lufthansa, we have a strong tradition of project management”, von Boxberg says confidently. “Project managers are Lufthansa staff, but designers usually are not. For each project of significant size, we encourage international design competitions to find the appropriate partner for our tasks. And as soon as every team member is on board, the design consultants become an integral part. This includes team meetings, regular telecons, direct

03. BMW Group
DesignworksUSA's
creative team at
the Singapore
studio

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04

exchange with manufacturers and presence at all critical design reviews. To allow for creative processes in general (not only for designers), it is important to set the right targets. This means: provide the right amount of information, give a general direction and timelines, and allow for independent solution findings. However, this process needs to be monitored regularly, allowing for work-in-progress meetings and intense discussions.”

BRIEF VS BROAD But can too much initial detail muddy the flow? Would the provision of only key parameters allow more scope for creativity? Paul Edwards, head of industrial design at Airbus, is pragmatic in response. “Ideally, any design team will have time to explore the issue in the broadest sense,” he reasons, “to identify the challenges and produce concepts before being narrowed

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WOULD PROVISION OF ONLY
KEY PARAMETERS ALLOW MORE
SCOPE FOR CREATIVITY? ”

down into workable solutions. Here the design manager can ensure the right level of information is provided to the team at the right time, steering the design work in the right direction and avoiding obvious no-go areas. However, time can sometimes be a luxury. So there are common elements to any briefing that are must-haves: time, deliverables, etc. It’s about being flexible and understanding the business needs.”

SKILLS VS HUMANITY For Airbus’s Edwards, having a strong working relationship with external agencies is just as important as their creative skills, which makes him tend to value longer-term collaborations. As he says, “In a complex, regulation-driven industry such as aircraft interiors, the experience and knowledge developed over time can be invaluable.”

But when new ideas are required, an ability to look beyond the project at hand is another important aspect. “As a manager of design, you are always looking at how you can support the business in the short, medium and long term. As well as understanding your internal team, an opinion on how and to whom could provide external support is also valuable. So when a fresh pair of eyes is required, a tender is advisable – as much to ensure the right chemistry and working relationship are present, rather than necessarily to prove skills and abilities.”

04. Designers working with Lufthansa receive clear targets

here's one I made earlier

The main feature talks about the potential pitfalls, but where are the success stories? For Paul Edwards, head of industrial design at Airbus, the A350 XWB stands out: "This long-term project not only worked well because of the excellent collaboration and communication between engineering, programme and marketing departments, but also because it started with a clear vision, which we unveiled at the 2008 Aircraft Interiors Expo. The size and timescale of the project gave design the opportunity to contribute on much more than an aesthetic level, from proposing a design vision, and guiding suppliers in implementation, to helping define new ways of working."

Over at Lufthansa, Dorothea von Boxberg, director of passenger experience design for business and premium, pinpoints even more succinctly why Lufthansa's recent new business-class design project worked so well: "Good team set-up, multilateral communication, intensive customer embedding, good risk management and the right partnerships – PearsonLloyd, B/E Aerospace and more."



05. The A350 project has worked well because it began with a clear vision



05

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GOOD DESIGNERS HAVE
A NATURAL ABILITY TO
COLLABORATE ”

SOLO OR GROUP? Once the designers for the job have been picked, there is some diversity of opinion as to whether you get the best out of designers by grouping them together in a tight-knit team or leaving them free to continue to interact with others to gain inspiration. Lufthansa's von Boxberg seems to lean towards the team approach, assigning, say, the seat and cabin elements to one team working within a larger context. Airbus's Edwards appears much more open to a more expansive approach. "I find diversity positive," he says brightly. "Drawing inspiration and insights from other industries and experiences is valuable and can lead to breakthroughs. Being too inward-looking can be limiting. Good designers have a natural ability to collaborate. It's an approach we promote within Airbus: our design team, engineering, programme and marketing departments are always collaborating to ensure we deliver balanced solutions that bring benefit to the airlines, to passengers and to Airbus."

Recognising the benefits of both ways of doing things, BMW Designworks' Zych favours a middle way, as she explains: "In 2007, we reconfigured our design studio to give our designers the best of both worlds, creating an open, collaborative space with transparent offices and mobile workspaces – similar to a city with special

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06. As BMW Group DesignworksUSA expands with this latest studio in Shanghai, communication between teams is critical

‘neighbourhoods’ or areas of expertise – and easily accessible by anyone. This environment allows for a fluid exchange of ideas, quick assembly of project team participants, and prevents any silo-ing of teams or subject experts. We also have dedicated project rooms that can be used by a design team for the duration of a project. This allows them to be fully immersed in a topic, and for the requisite levels of project confidentiality to be maintained.”

So the design team is picked and working in top secret or, conversely, exchanging regular ideas internally, but how should the design process be managed for best effect, so that management can be sure all is going to plan? Top-down checks, grass-roots workers collectively reporting back to management, or some other way?

“This is a critical balance point for a creative consultancy,” BMW Designworks’ Zych stresses. “Our design process ensures the core project team has the appropriate time to explore and push creative boundaries, while keeping the creative leadership looped into the progress. Project reviews typically happen weekly/as needed, and the ‘quality circles’ [mentioned earlier] occur before critical programme milestones. It is important to have a formal structure for feedback loops, but that does not mean we are a formal culture. It is the daily informality that creates the connections, trust and mutual respect.”

For Airbus’s Edwards, it’s not so much who reports to whom, although he says that should be clear from the start, but how the message and communication are delivered – a skill he believes the best designers should be naturally good at. “Design is better than anyone at telling a story, visualising or making the qualitative understandable. However, to get the right results and decisions, design also needs to speak a language that business understands.”

Lufthansa’s von Boxberg comes across as a little stricter on this last point: “Most of Lufthansa’s cabin interior design projects work towards a very specific timeline. In all cases, crucial work is finished on time and with the expected level of quality. With projects lasting between two and three years, a professional project management routine has to be set up to manage major milestones such as customer tests. These also dictate the reporting structure.”

DISPUTE MANAGEMENT But as theoretically lovely, organised and/or well-drilled these structures may or may not be, with humans and their emotions involved, differences of opinion are still bound to occur. Time for the design manager again. But what peace-keeping and conflict resolution works best? “Design is all about dialogue and exploring different opinions,” Airbus’s Edwards starts.

Can you sense a big ‘but’ coming though? “However... when it comes to making a decision, if the brief is clear and agreed then most differences of opinion are easily

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DIALOGUE AND EXPLORING
DIFFERENT OPINIONS”



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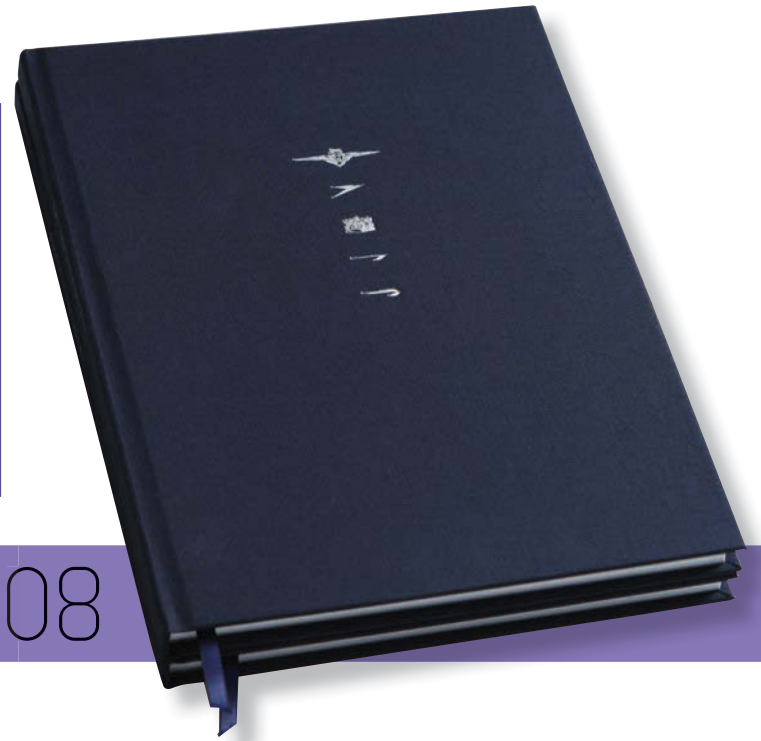


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08

07. Lufthansa's Dorothea Von Boxberg (left) and Richard Stevens of Forpeople and BA (right)

08. This smart-looking tome is Blueprint, the strategic design tool created by British Airways and Forpeople

resolved. Design should be able to justify itself, either qualitatively or quantitatively. There should be a reason or rationale behind each decision. It can draw on resources such as defined consumer insights, research, design language definitions or even business goals and objectives.

"The situation to avoid is 'design by committee'. If there is a design decision to be made, ultimately the head of design (if not the lead designer) should dictate the decision. On a broader level and when other departments are involved, a steering team can be helpful in resolving a difference of opinion."

On this subject, Lufthansa sounds more open to compromise. Says von Boxberg: "We have a strong culture of incorporating many different points of view from all the stakeholders – including passengers – into the project. In our experience, this creates more work in the beginning, but in most cases leads to the better result. Conflicts are usually the result of misunderstandings, and allowing for the right amount of time for discussions and problem-solving, most often 'natural solutions' evolve."

Good design management can keep disputes to a minimum, keep good designers happy and make design central to the business. BA's Stevens says he wants to develop the latter in particular as part of his new remit, and has an unusual dual perspective on the management process, as he is also the founder of an external agency that works with BA (London-based Forpeople).

"I do think we need a much better structure in-house to pull design back to the core of the business," he says candidly. "Every year we create a total vision of what the 'customer journey' should be in the next five years. It's not just about managing the external team – it's about the internal team creating their own ideas. Having been on both sides, my frustration is that a lot of the time there's a huge amount of expertise within the [internal] business, but you can tend to act a bit dumb and put all the onus on the outside agency, instead of forming your own opinion and then combining it with the external opinion."

Scott Savian, Zodiac Aerospace's cabin and structures executive vice president for customer and product, goes one step further, preferring the 'in-house' nature of its industrial design department, ZEO, as he qualifies: "ZEO has never seen industrial design as a piece of the puzzle or part of the process. To be truly immersed in the design process and fully vested in the solution, a design house must be part of an OEM. In that manner, you are not just selling hours. The ZEO difference is the inclusion of equal parts of industrial design, engineering and prototyping. This helps ensure a result that matches or exceeds the original goal. I honestly believe the savings we are realising in cost and lead time through this holistic approach will be the future of design in our industry. Apple, for instance, follows this type of approach."

Ultimately though, wherever the design is carried out, it must be managed with care. And while design managers might sometimes be unfairly tarred with being the duller, less creative, and even least fashionable members of the design department, if they get the balance right, the creative results should lead to the most functional, aesthetically pleasing and commercially successful products. However, if the design manager drops the ball in any one of those areas, function or aesthetics alone probably won't save it. The moral of the story? Respect the jugglers. ☒

“
CONFLICTS ARE USUALLY
THE RESULT OF
MISUNDERSTANDINGS”



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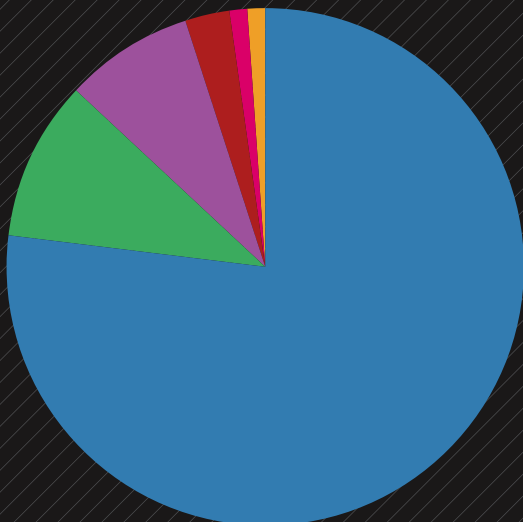
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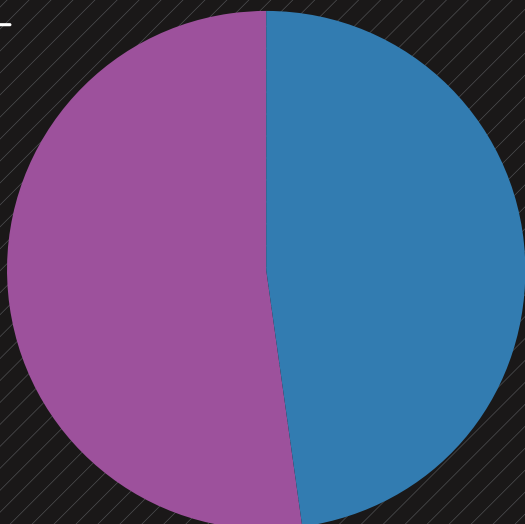


01
CONNECTED AIRCRAFT BY REGION



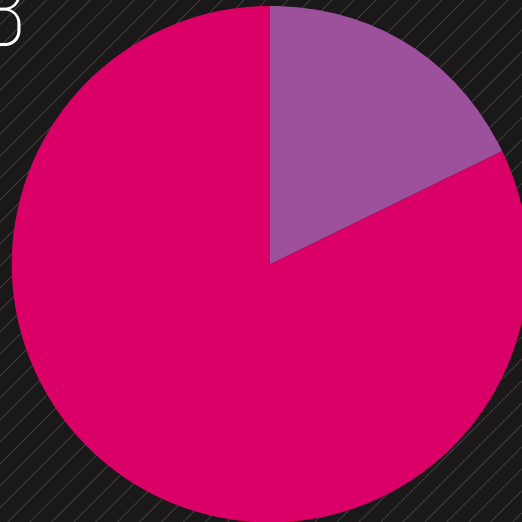
- 77% North America
- 10% Middle East
- 8% Europe
- 3% Pacific Rim
- 1% South America
- 1% Africa
- 0% Asia

02
EMBEDDED IFE PENETRATION ON GLOBAL PASSENGER JET FLEET (INCLUDING REGIONAL JETS)



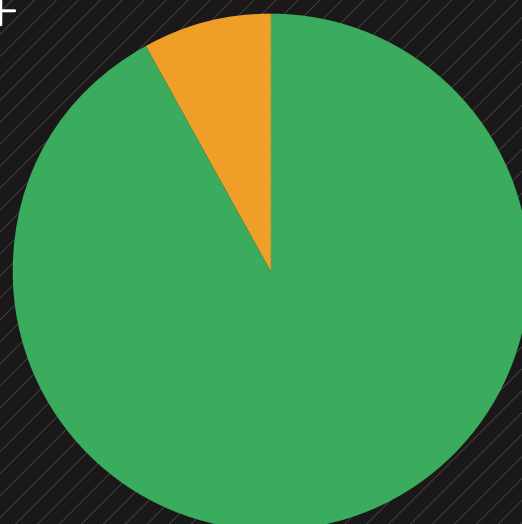
- 52% Embedded IFE
- 48% None

03
PASSENGER CONNECTIVITY PENETRATION ON GLOBAL PASSENGER JET FLEET (INCLUDING REGIONAL JETS)



- 18% Connected Aircraft
- 82% None

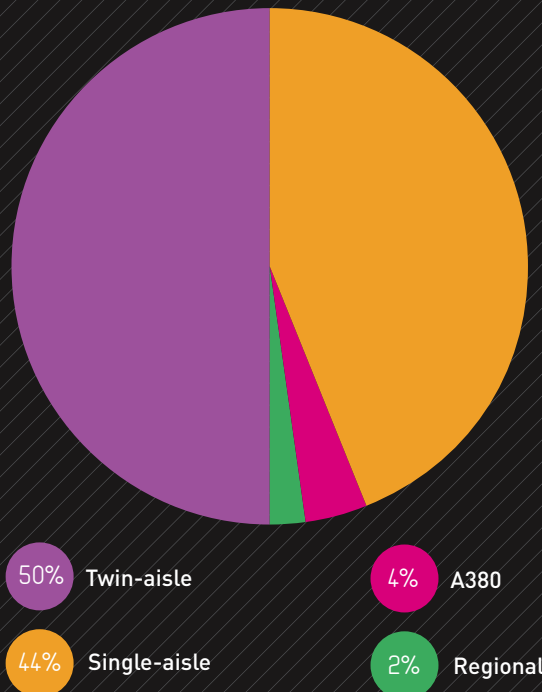
04
WIRELESS IFE PENETRATION ON GLOBAL PASSENGER JET FLEET (INCLUDING REGIONAL JETS)



- 8% wIFE
- 92% None

05

CONNECTIVITY BACKLOG BY AIRCRAFT TYPE



watchout

IFE and connectivity are going through an exciting growth stage. Many factors are influencing the trend, from aircraft deliveries and aircraft size, to differences between line-fit and retrofit markets

ROBERT SMITH, IMDC



How should one assess the fortunes of the aviation industry? There are so many indicators that very often seem to paint a contrasting picture. And if assessing the current position of the industry is confusing, then how to forecast the future? IMDC produces forecasts for passenger inflight technologies, namely IFE hardware, the content delivered through these systems, and passenger connectivity installations. There are, of course, multiple factors that affect the deployment of inflight technologies, but IMDC's experience in this unique sector has given it a good understanding of the prime drivers and upcoming trends in the industry.

AIRCRAFT DELIVERIES Aircraft deliveries are a crucial factor for inflight technologies. A forecast for aircraft production, in conjunction with IMDC's database for the current global fleet, forms the foundations of its inflight technology forecasts. Of course, to predict the future you must first understand the past (and present), so IMDC constantly monitors and tracks installations for embedded IFE, passenger connectivity and, most recently, wireless IFE, where passengers' own devices receive streamed content stored on board the aircraft.

Regional trends are also crucial. Understanding the difference between the major world regions for aviation is essential to understanding and predicting airline products



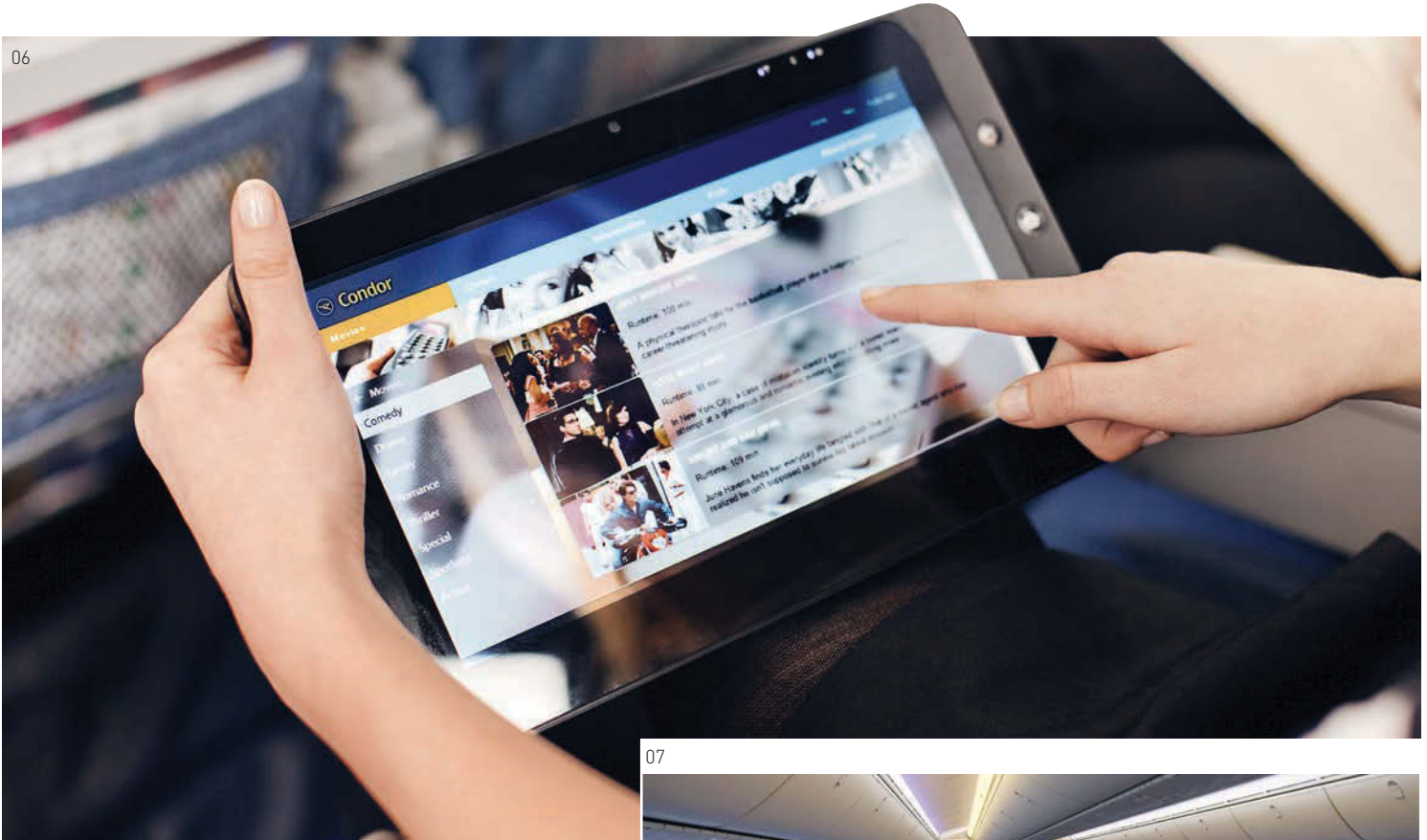
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06



07



“SO MUCH OF THE FORTUNES OF THIS SECTOR ARE DICTATED BY FUTURE AIRCRAFT DELIVERIES”

and the prospects for different inflight technologies. Data that is globally aggregated can tell only part of the story for any inflight technology, as there are fundamental differences between each region. For example, at the time of writing, over 75% of all aircraft that offer passengers connectivity to their own devices are based in the North America region.

A perhaps more obvious point is the different inflight technologies likely to be deployed on different types of aircraft. IMDC's database shows that in-seat AVOD was fitted on 98% of twin-aisle aircraft entering service in 2013. Of course, for single-aisle aircraft this percentage was much lower. Just less than half of these aircraft entering service in 2013 had no IFE at all fitted, with the remaining aircraft roughly evenly split between offering overhead IFE and AVOD or Direct Broadcast Satellite Television. This relationship between inflight technology and aircraft type is crucial to understanding and interpreting forecast data.

There are many aircraft production forecasts available; Boeing and Airbus even make their own forecasts freely

available. There are generally large discrepancies between forecasts, which can make predicting inflight technology installations challenging when so much of the fortunes of this sector are dictated by future aircraft deliveries. IMDC bases its forward-looking data on production-based forecasts that account for macro- and microeconomic factors that affect commercial aircraft, as well as the relative attributes of current and future aircraft types.

Looking at this forecast for aircraft production, a steady upward trend through to the end of the decade is apparent. Knowing how significant new aircraft deliveries are to inflight technology installations, this gives initial cause for optimism for anyone involved in the sector. However, the devil is in the detail. Closer examination of the production forecast shows that twin-aisle deliveries – so important to inflight technology installations and expenditure – are expected to reduce in number roughly at the midpoint between the start of the forecast period and the end of the decade. The overall upward trend for aircraft deliveries is fuelled by single-aisle aircraft, which are predicted to increase over most of the forecast period.

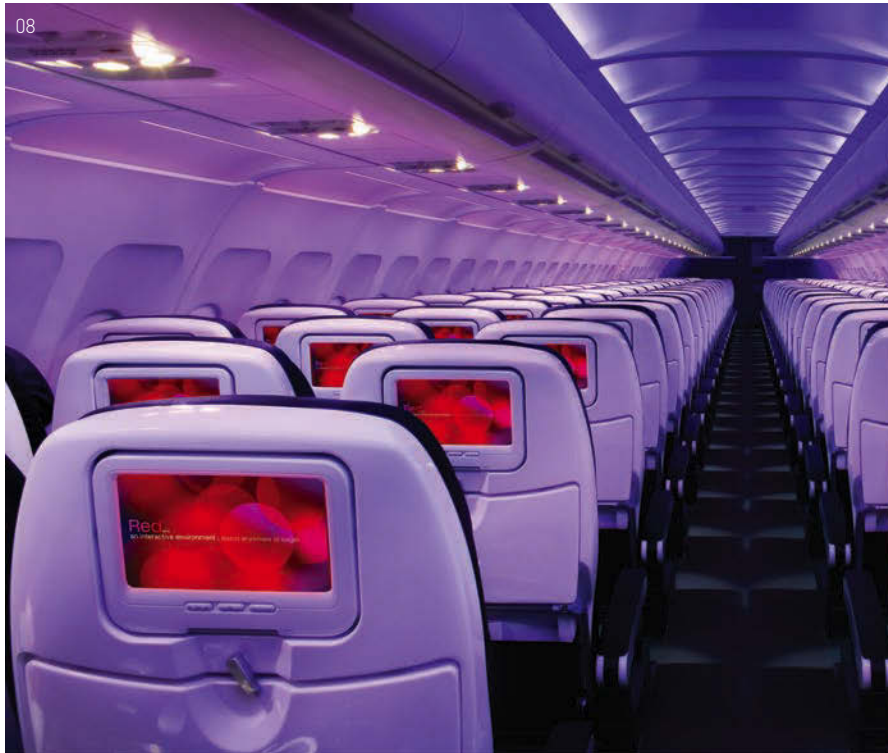
- 06. Wireless IFE systems such as Lufthansa Systems' BoardConnect are rapidly growing in popularity
- 07. Twin-aisle IFE installations such as this LAN cabin form a large portion of the industry expenditure



THERE IS A COMMON FACTOR: A REDUCED COST PER SEAT IN TERMS OF IFE



09



08

- 08. Virgin America has invested to make its IFE a key part of the passenger experience
- 09. Flydubai was bold in becoming the launch customer for the Lumexis FTTS IFE system

In aircraft delivery terms, single-aisle aircraft outnumber twin-aisle by roughly 3:1 over the forecast period. Unfortunately for inflight technologies, it is twin-aisle aircraft that will generate the most expenditure on IFE. While the total number of installations for IFE is still forecast to be greater for single-aisle aircraft than twin-aisle (although nowhere near the 3:1 ratio of deliveries), the average expenditure per aircraft is significantly lower due to the reduced seat count and, of course, the greatly reduced probability that such aircraft will be fitted with AVOD IFE.

Given the aircraft delivery forecast described above and the outlined impact for inflight technologies, it becomes easier to understand expectations for inflight technology installations and expenditure. While IMDC's forecast is for total installations of IFE to increase steadily over the forecast period, actual expenditure on this sector is forecast to begin a downward trend somewhat before the end of the forecast period.

Of course, line-fit IFE installations are not the whole picture. Retrofits account for a significant part of the market and, in some ways, are less predictable than line-fit installations, as airlines can choose to conduct these installations for a number of reasons other than the age of their aircraft. Nevertheless an aggregated picture emerges,

with retrofit installations forecast to steadily increase as previous record aircraft deliveries require their first cabin updates.

There is, however, another key factor in determining future IFE expenditure: expected prices of IFE installations over time. There have been many recent developments for IFE hardware, and there are undoubtedly many more to come. Seat-centric IFE, wireless IFE, new overhead systems, and a resurgence of airline-offered portable devices spurred by consumer tablet technology, will have differing impacts on the inflight technology space. There is also a common factor among all these developments – a reduced cost per seat for airlines in terms of IFE hardware. Incorporating this trend for falling hardware prices into forecasts gives the result that the benefit of increasing retrofit installations over the forecast period is partially offset by the assumed decreasing cost per aircraft of IFE systems.

WIRELESS IFE The expectations above relate only to embedded IFE hardware. Of course, inflight passenger technologies consist of more than just overhead and in-seat IFE systems. Wireless IFE and passenger connectivity are both fast-growing services, neither of which have yet reached their full potential. IMDC data

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shows that embedded IFE is present on just over half of all commercial passenger jets (including regional jets); passenger connectivity is available on about one in five aircraft at the time of writing; and wireless IFE less than 10% of the total.

Looking at the data behind wireless IFE installations demonstrates the importance of detail. So far, the majority of installations are on single-aisle aircraft with no additional embedded IFE. While this would seem to be a reasonable indicator of future trends – and it could well be – it is more by luck than design for current installations. Towards the end of 2013, the vast majority of wireless IFE installations were on aircraft already fitted with passenger connectivity systems.

However, this is not so much an indication that wireless IFE is best suited to connected aircraft. Rather, it shows how providers of inflight connectivity have sought to maximise the capabilities of their hardware already on board aircraft by adding this additional service. In doing so, they create an additional source of potential revenue, although like connectivity services themselves, passenger usage rates are crucial to the revenue contribution of wireless IFE.

At present, passenger connectivity installations are also significantly skewed towards particular regions, technology and aircraft. More than three-quarters of connected aircraft (passenger services) are based in North America. Single-aisle aircraft make up a slightly smaller percentage of the global connected fleet. So, despite years of high interest, orders and installation projects, the majority of connected aircraft today are flying domestic US routes offering air-to-ground or regional Ku-band satellite-based services.

Looking at IMDC's backlog data for passenger connectivity gives a more balanced view of the future direction for inflight connectivity. Figures show that just over half of aircraft committed to passenger connectivity

about IMDC

IMDC has been assisting airlines and their partners in optimising their investment in cabin and communications technologies since 1999. IMDC's consultants are experts in media, content, technology, connectivity and airline operations. The company is widely recognised as a leading organisation in this sector for market research, executive training, product evaluation, independent strategy development and project management.

services, but not yet fitted with them, are twin-aisle models. This is particularly impressive when considering the extent to which single-aisle aircraft outnumber twin-aisle. The type of connection on the connectivity backlog is also interesting. Just over half are due for Ku-band satellite connectivity, followed by L-band satellite, Ka-band services, then air-to-ground (at the time of writing). Line-fit availability is a key factor in both of these observations. L-band connectivity has been a line-fit option for many years now and there are still many deliveries yet to be made. Ku-band connectivity has been a more recent line-fit option and while many orders are for retrofit projects, an emerging trend is apparent. Passenger connectivity is moving into a similar position as AVOD IFE, and airlines ordering large aircraft find it difficult to exclude it from the product mix.

- 10. A Gogo air-to-ground antenna
- 11. Delta promotes its offer of Gogo onboard internet
- 12. Gogo's Ground-To-Orbit technology could deliver more than 60Mbps to the aircraft



JUST OVER HALF OF AIRCRAFT COMMITTED TO CONNECTIVITY SERVICES, BUT NOT YET FITTED WITH THEM, ARE TWIN-AISLE





PERSONAL DEVICE TRENDS CAN AND WILL MAKE A NOTICEABLE IMPACT ON INFLIGHT TECHNOLOGIES



about the author



Robert Smith is the director of market intelligence services at IMDC, where he began working in 2006. He is the primary author of the IMDC *Inflight Technologies Market Outlook Report*, for which he produces a five-year market forecast and conducts analyses of trends in IFE hardware, content and connectivity.

Smith has worked on major consulting projects for IMDC, including those for Royal Brunei, Southwest and LAN Airlines. He holds an honours degree in business economics from the UK's Exeter University and has lectured in airline marketing at Cranfield University in the UK. You can contact Robert at robert.smith@imdc.net



13



14

- 13. IFE displays can even help with cabin branding, as Iberia shows
- 14. British Airways will soon begin a 12-month trial of Panasonic Avionics' Global Communications Suite

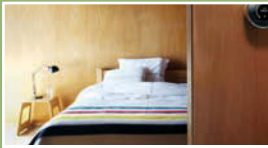
SINGLE-AISLE OPPORTUNITIES There is a significant and growing opportunity presented by single-aisle aircraft. In number, they represent a dominant share of the potential market, but measured by expenditure and even installation count, twin-aisle aircraft still dominate the IFE technology sector. It would seem that providers in this space have started to react to this opportunity, and a wave of new products specifically targeted at single-aisle aircraft are in the pipeline. The market seems unsure of what is best suited to the single-aisle sector. In addition to connectivity and wireless IFE solutions, there are different approaches to embedded IFE being launched by different suppliers. Low-cost, seat-centric AVOD IFE systems with line-fit availability; reduced hardware overhead systems; and hybrid solutions offering partial AVOD, wireless IFE, and overhead – all are being developed and all targeting single-aisle aircraft.

PASSENGER PREFERENCE A final and perhaps most important consideration is passenger behaviour and preferences. An IMDC passenger survey conducted in mid-2013 indicated that personal device trends can and will make a noticeable impact on inflight technologies. There are many existing data sources for the growth of smartphones and tablets. An important finding of the IMDC passenger survey related to the propensity of passengers to carry, and then use, different inflight personal electronic devices on board.

Laptops were widely owned by survey respondents, but many were left at home, and even fewer were used during flight. Smartphones were widely owned and carried on board, but the number used during flight was significantly lower; tablets showed the opposite characteristic. While not as widely owned as laptops, tablets were very likely to be brought on board, and also very likely to then be used during a flight.

In fact the survey discovered that, for this sample, smartphones and tablets are used almost equally on board, even though smartphone penetration is considerably higher. Driving this usage were preferences for personal content selection and the ability to continue the experience beyond the flight. Providers of inflight technology can heed these preferences in their product design and also take heart from the fact that convenience, content selection, and second-screen behaviour, mean that passengers still derive value from having a screen at their seat.

In conclusion, it is apparent that all forms of inflight technology – IFE, connectivity, wireless IFE – have a place in the future cabin. Line-fit availability is important when future production is set to maintain record-breaking levels, and solutions for single-aisle aircraft look set to become increasingly relevant and potentially more diverse over time. And, most importantly, passengers' appetite for both content and connectivity can only grow as new devices increase the potential audience on board each aircraft. ☒



TEAGUE
028



PRIESTMANGOODE
032



FACTORYDESIGN
036



SEYMOURPOWELL
040



JPA DESIGN
044



PEARSONLLOYD
048



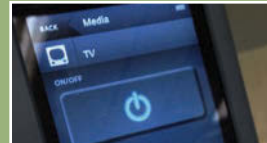
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PIERREJEAN
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TANGERINE
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B/E AEROSPACE
064



MORMEDI
068



TXS
072



DESIGNSCENCE
076



CAON STUDIO
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ALTITUDE
084



MÜLLER/ROMCA
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ID GROUP
092



AIM AVIATION
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PAGE
100



TTF AEROSPACE
104

DESIGNSHOWCASE

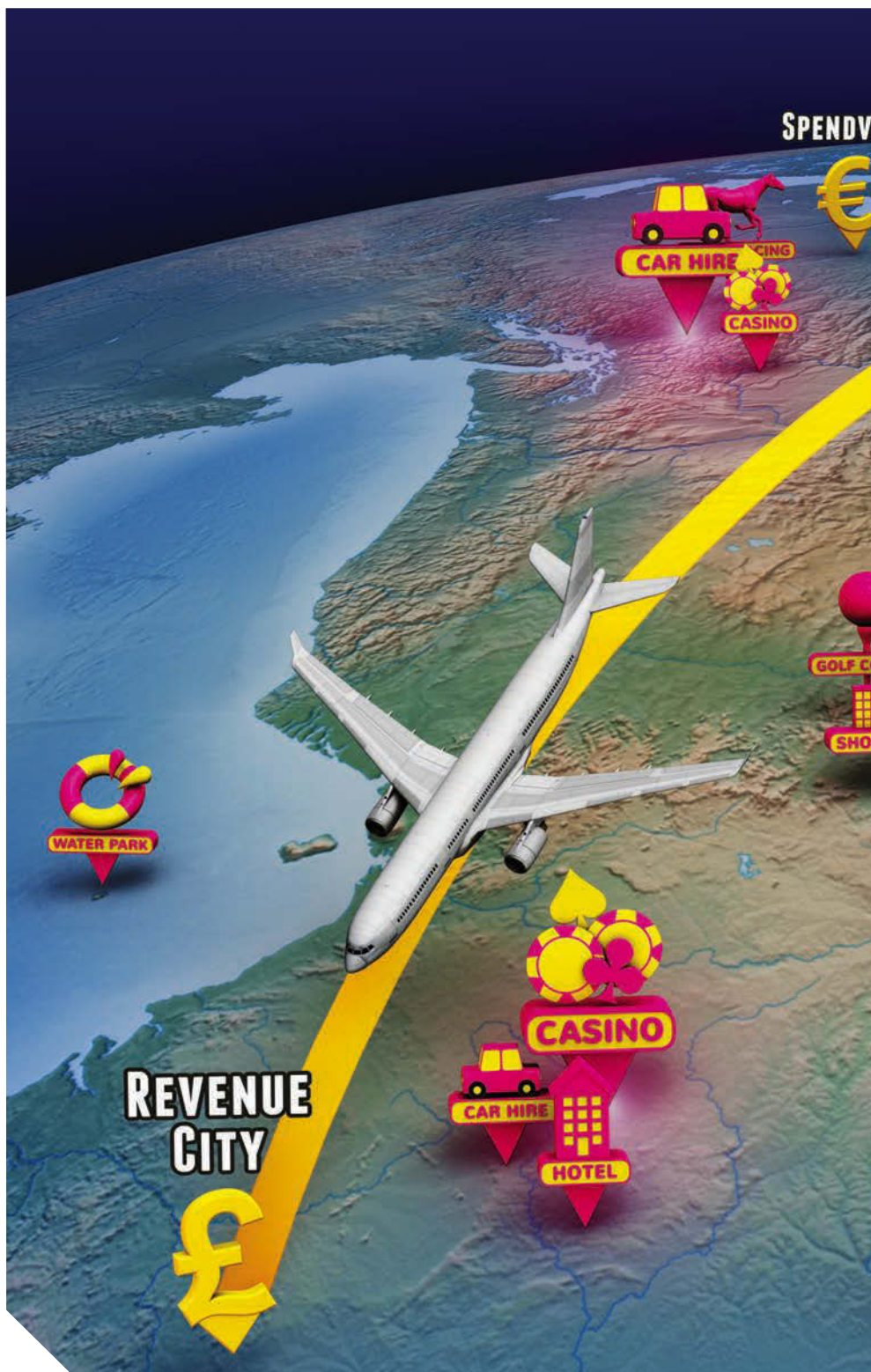
beyond distraction

Devin Liddell, principal brand strategist at Teague, discusses why airlines should think differently about connectivity

Here's a giant red flag: inflight connectivity is now more frequently described as a new 'cost of doing business'. This is terrible news for airlines. First, the airline industry definitely doesn't need any more costs; the average airline's profit margin is just 0.1%, and more costs won't move this in the right direction. Second, a 'cost of doing business' is another way of saying 'requirement' and code for 'commodity'. These are also things that airlines don't need any more of, because airlines have already let themselves become far too commoditised already. Put simply, airlines need more ways to stand apart from each other – not more ways to be exactly the same.

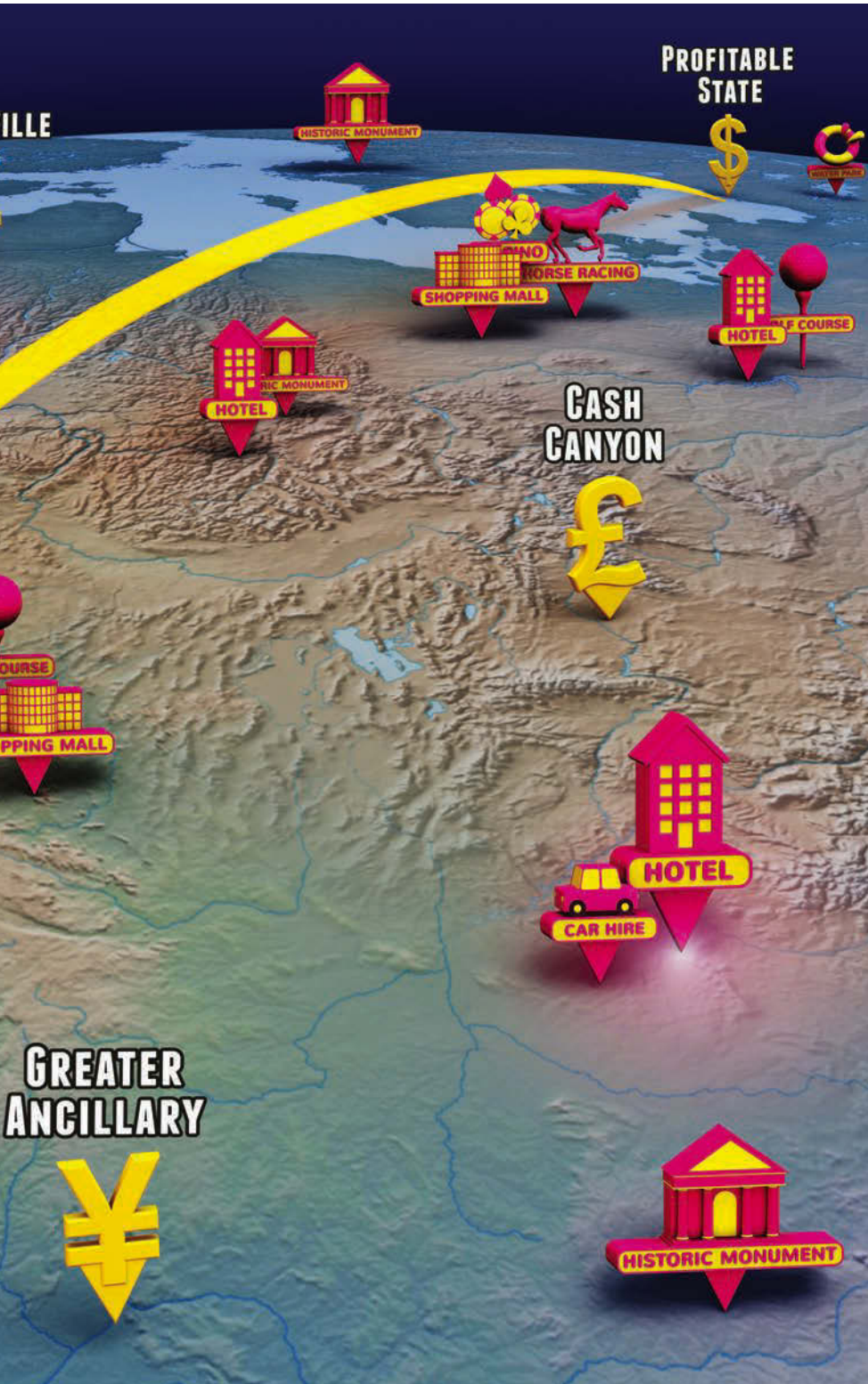
Unfortunately, this is the path many airlines are taking with connectivity, falling into the same commoditisation trap wherein connectivity on one carrier is generally indistinguishable from connectivity on another. In fact, the website for one of the leading connectivity providers – which itself has a very vibrant brand – references that it is the 'exclusive provider' of connectivity to 10 different airline brands, all of which operate in the North American market. The current number of equipped aircraft might be different, but the connectivity offering itself is mostly the same across any of these carriers. That's a lost opportunity for all of those carriers.

Given this, the industry then soothes itself with the idea of 'monetising' the service by retailing to its 'captive audience'. This idea of ancillary revenues saving airlines from the perils of commoditisation is increasingly pervasive. But it's a fantasy. Already, there is an inverse relationship between an airline's emphasis on ancillary revenues and its passenger preference ranking. For example, of the 10 largest airlines in the world by revenue last year, three of them boast a top-20 Skytrax ranking for passenger





ARE PASSENGERS REALLY THAT EAGER
TO GO ON AN ONLINE SPENDING SPREE?



preference, while the other seven are well outside the top 20 in passenger preference. Ancillary revenue as a percentage of total revenue averages just 1.5% among the high revenue/high preference group. The high revenue/low preference group's average is 10%. The short version of this data: the more you depend on ancillary revenues, the less passengers prefer you. So the real cost of making ancillary revenues a bigger portion of your income is your brand. That's not a good transaction.

Yet there are those who believe passengers are just panting to buy sporting, theatre and concert tickets while on board, or buy clothing and other products from retailers. But given that the current 'take rate' for onboard wi-fi (the percentage of passengers who pay for a connection) is just 6%, how many passengers are really that eager to go on an online spending spree at 30,000ft? Even if they do want to buy items, why not buy them before or after the flight? What problem – beyond procrastination – is inflight retailing really solving for passengers? Remember, one of the fallacies at the heart of the dot.com bubble was the notion that just because you could buy something in your pyjamas, you would. As it turned out, not so much. The same thing is happening here. And it's likely that the real problem inflight retailing is hoping to solve has nothing to do with what passengers actually want and everything to do with an airline's need for more revenue. That alone is a good reason to suggest it will not be successful.

If an airline values its brand, and actively wants to create a passenger experience – in any class – that inspires passenger preference (and, thus, deserves premium pricing), it should abandon the industry's current trajectory of me-too connectivity offerings and, instead, take two bold steps forward: create something from inflight connectivity that is

ILLUSTRATION BY MAGIC TORCH



representative of its unique brand, and then give it away for free.

CONNECTING BEYOND THE TUBE

One of the earliest and most ubiquitous applications of inflight connectivity is the moving map, which lets passengers track the progress of their flight. While the map remains one of the most popular IFE features, this is not complementary to the flying experience (its equivalent inside a hotel room would be a 'countdown to checkout' clock that guests enjoyed looking at). Still, the moving map created early context for inflight connectivity's emphasis on entertainment. This has now expanded to include productivity (offering wi-fi to business travellers so they can connect with people and data on the ground) and service (giving pilots and flight attendants more sophisticated tools for managing the needs of aircraft and passengers). But there's another opportunity area airlines should consider even more when designing their inflight connectivity offering: connecting passengers to the next phase in their journey – specifically, hotels.

Inflight connectivity platforms should be built around real passenger needs and desires, both functional and emotional, which the airline is well-positioned to solve. Most airlines are not experts in retailing. They are not experts in entertainment either. So, at best, most airlines can be proxies for retail and entertainment partners, which is fine, but there's very little benefit to the airline brand. However, while airlines aren't Amazon or Netflix, they are travel experts. They are also natural design partners with hotels, in terms of both serving travellers and designing for confined spaces. Fuelled by inflight connectivity, airlines and



THIS IS ABOUT INSPIRING REAL LOYALTY – NOT THE KIND OF LOYALTY TRADED IN POINTS AND MILES



01. Imagine setting the temperature of your hotel room before you even land
02. Why even check in? Your smart device can become your hotel room key

hotels have an opportunity to create something truly transformative together.

Imagine this scenario: a flight is set to arrive around 9:00pm, just an hour or so before most hotel room service and on-property dining kitchens close. So, after watching a new-release movie, a passenger uses an airline's custom app on board to check-in to the hotel (since arrival is now imminent), which sends a digital room key to her smartphone so she can skip the front desk altogether. Then, the passenger uses that same app to schedule a room service order to be delivered just after she arrives at the hotel. But she's not done yet. She also uses the app to optimise the temperature in her hotel room, thanks to the networked thermostat that interfaces with the airline's custom app. Because all of this is only possible because of the airline's special partnership with the hotel,

these services are only possible on board its aircraft.

This is anti-commoditisation. This is about inspiring real loyalty – not the kind of loyalty traded in points and miles and rewards. This is about doing more – and doing more differently – to create passenger preference and command premium pricing versus the competition, which are the primary reasons to build a brand in the first place. And this is just one scenario within an expansive set of possibilities for airlines to use inflight connectivity in a way that goes beyond the idea of just distracting passengers or selling stuff to them. That's what this industry needs, and it isn't even anything airlines would need to charge passengers to use, because the resulting passenger preference and premium pricing will do more for bottom lines than selling stuff to 'captive audiences' ever will. ☒

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come together

Technology is a key part of cabin design, and how passengers interact with it is critical to customer satisfaction

01. The first class experience onboard Malaysia Airlines' A380 comes complete with a first-class GUI design



“Over the past decade, there has been a real surge in the airline industry to employ design to improve aircraft interiors and focus on the passenger experience,” explains Luke Hawes, a designer and director at global travel and transport design consultancy Priestmangoode. “While the focus has largely been on seats, trim and finish, and branding, it is now paramount that we develop technology and connectivity within the aircraft. Technology is an integral part of our lives, and there is still a disconnect between the products passengers use in everyday life, like smartphones and tablets, and products onboard the aircraft. We’re working with airlines and suppliers to bridge that gap.”

Indeed, technology onboard the aircraft is integral to a good passenger experience and – more importantly – to strengthening brand/customer relationships. A recent article by leading programmer and authority on user experience, Kathy Sierra, extolled intuitive design in technology and user interfaces. A series of experiments demonstrated that having to think about how to use a product, app or website drained a user’s cognitive resources, leaving them unable to spend those resources on other tasks. While no one would argue against the obvious benefits of intuitive design, namely ease of use, the article focused on the physiological effect of badly designed interfaces. The baseline of the article in short was that intuitive design not only enables users to focus their time and energy on other aspects of their lives, but leads to subconscious positive associations with a brand that are likely to result in brand loyalty.

Priestmangoode has worked on countless GUI projects for clients such as Malaysia Airlines and Thai Airways International, as well as developing user interfaces that enable passengers to change their seat environment, such



as the touchscreen seat controllers for a number of airlines, including Swiss Airlines and Etihad.

THE IMPORTANCE OF GUI Hawes continues, “In 2010, TAM hired us to do a complete design overhaul of their interiors, from the seats to the galleys, as well as their IFE system. It was a great opportunity to create a product that became an integral part of the inflight experience. The GUI should be seen as part of the cabin interior and, as such, the colour palette, graphics style and overall design language should complement the trim and finish of the cabin to create a seamless brand experience. The branding should be less ‘slapping on a logo’ and more a multilayered experience, with every detail of the GUI – radius, hue, icon,

shadow, pattern – being a digital counterpart of the physical space.”

For TAM Airlines, Priestmangoode developed a GUI with a heavy emphasis on imagery to take advantage of better resolution monitors on board the aircraft and to align the onboard product with TAM’s existing online and print branding. Across individual classes, all GUI – both IFE and touchscreen – picked up on the colour palette of the cabin interiors: a neutral base palette with green colour accents in first class, and red accents in business and economy class.

The GUI is often considered as an afterthought, when its design should be part of the brief from the outset. A leading design magazine recently featured an article on the importance of user experience in customer relations.



“

THE GUI IS OFTEN AN AFTERTHOUGHT,
WHEN IT SHOULD BE PART OF THE BRIEF”



The feature looked in particular at the ways in which the majority of businesses invest in ‘attendance’ strategies – establishing a presence in existing channels – instead of exploring new technologies. This rings true in the airline industry. But there is great scope for designers and IFE suppliers to work together on concept ideas to optimise passengers’ user experience of products on board the aircraft and to develop new products.

Hawes explains, “This is something that we have started doing with IFE suppliers, and it’s something we’ve already been doing for years with seat manufacturers in the industry. Working directly with suppliers on concepts leaves greater room for exploration and innovation. We’ve found it an immensely rewarding process. The

skills and expertise of suppliers, combined with our experience of designing holistic environments, has given great results in the past. For instance, quite frequently, our latest seat concepts get snapped up almost instantly and become leading commercial products. We’re very excited about developing similar working methods with IFE suppliers.”

The benefits of technology and connectivity on aircraft don’t just extend to the passenger experience. There is the opportunity for great value here for airlines and there are myriad applications that have yet to be explored to their full potential.

Nigel Goode, co-founding director of Priestmangoode, explains, “Developing brand new products can help airlines differentiate themselves.

For instance, when we designed the interiors for Lufthansa’s A380, we designed a brand new handset for the first class cabin. We place a lot of emphasis on hardware, on the quality of materials and surface finishes. Featuring aluminium buttons and a backlit screen, the handset is a unique product, emphasising the notion that passengers are flying a truly tailored and high-end service.”

THE BROADER PICTURE “From a business point of view, there is also great potential for technology and connectivity to increase airline efficiency,” continues Goode. “Sending meal preferences to the airline before flights would save carriers both space and money as they wouldn’t need to store as much food on board the

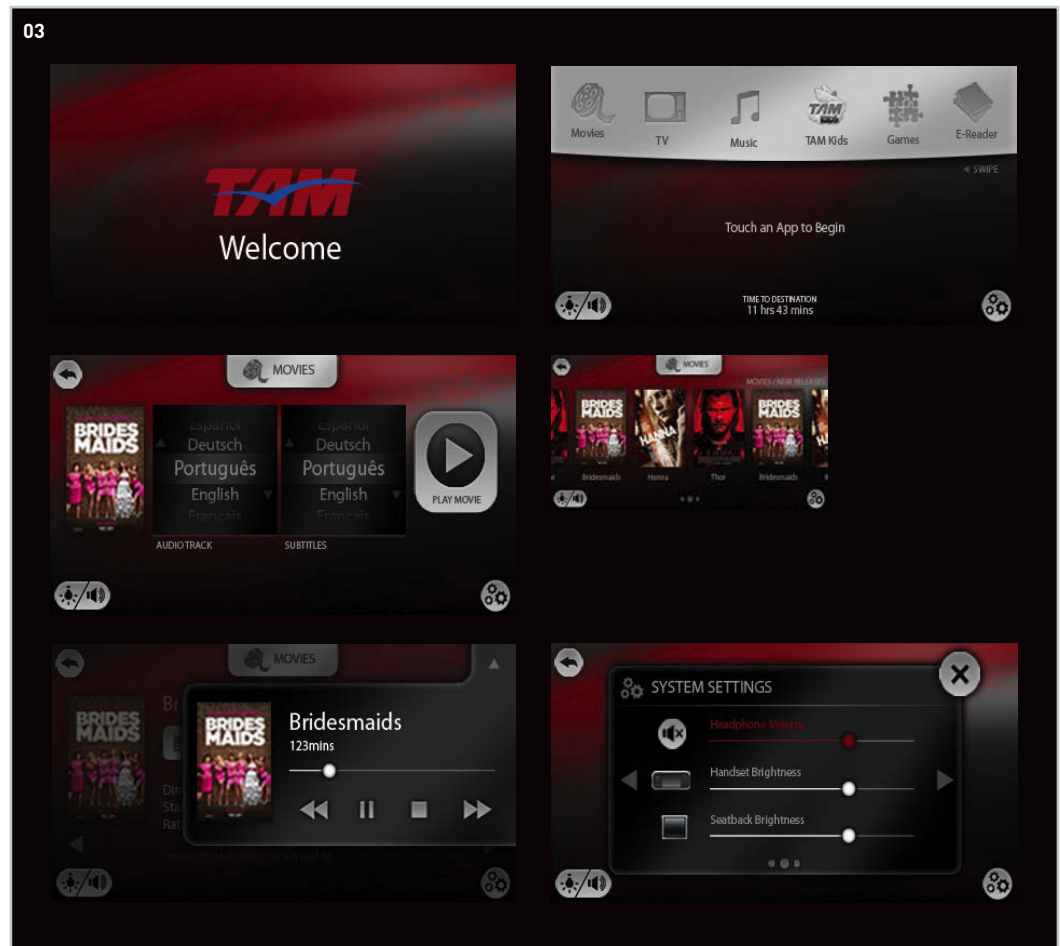
02. The touchscreen seat controller in Swiss Airlines’ first class

“DESIGN FOR US HAS TO WORK, NOT JUST FOR THE USER, BUT AS AN EFFICIENT BUSINESS TOOL”

aircraft. Digital tickets that track passengers and bags in airports would enable an airline to see if a passenger will make the flight. And then there are onboard applications, such as wireless communication between passengers and staff in the galleys, which would facilitate service.”

Communicating with an airline pre-flight would also provide additional benefits to passengers. The ability to sync with a mobile app for instance, would enable passengers pre-boarding to shortlist films or pre-order dinner. For regular flyers, there could perhaps be a ‘Saved Settings’ mode where their favourite seat position and lighting presets are saved. Once on board, the IFE would sync with the app and the passenger would have all these presents ready to go. As Goode explains, “It’s about pre-empting what you want and using technology to create a stress-free travel experience.”

GUIDING PRINCIPLES When quizzed on the leading factors in developing technology and GUI for airlines, Hawes states his firm’s four guiding principles: usability, brand continuity, adaptability and future proofing. He explains, “Design for us has to work, not just for the user, but as an efficient business tool. Usability has to be the leading factor in developing technology and connectivity. Products need to cater to both tech proficient and tech illiterate passengers across multiple languages.



Brand continuity comes next: technology offers a wide and varied platform to strengthen a brand – from graphics/logo to an overall palette that will complement the cabin interiors. Adaptability to different types of systems, from dumb monitors with handsets to touchscreen systems, is also important. Our final design principle is future proofing. It’s important that the overall configuration is able to accommodate new product features or ‘add ons’ without major re-work and cost. Our removable tablet for South African Airways replacing the hard-wired monitor for the onboard IFE is a good example. It’s more flexible and adaptable to future developments in onboard technology.”

Clearly, aircraft interior design is becoming increasingly complex and all

03. TAM’s GUI is a multilayered brand experience

encompassing. “That’s what makes our work so interesting,” continues Hawes. “Where a few years ago you might have designed a new seat, today we’re designing everything from livery, uniforms, cabin interiors, websites, mobile apps, to graphic items and ground services.

“We’re in a unique position in that we have extensive experience and a great track record in the aviation industry, but our background lies in product design and detailing. So while we take a holistic approach to aircraft interiors and always consider the entire journey from home to destination, the way in which we do this is by making every aspect of that journey a user-focused experience. Today, connectivity lies at the very heart of that experience.”

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seats of power

A great seat needs great design. Two seat companies are benefiting from Factorydesign's experience, as is JetBlue's new premium offering

Here's a thing... to set up a design company (which Factorydesign did 16 years ago), you need a computer, a very small office, a phone and a brain... that's about it. And a customer or two. However, if you want to start an aircraft seat manufacturing business, you need a whole lot more: approvals, certification, a reliable supply chain, much bigger premises, skilled labour. And a customer or two.

So you may think these challenges would be insurmountable, yet new seat manufacturers offering new seat products seem to be popping up, and Factorydesign has been privileged to work with a number of them.

Two client aircraft seat manufacturers have emerged over a period of little more than 10 years, each starting with an idea, and now their products are among the best in the sky. In southeast England, Acro Aircraft Seating builds and sells a range of economy seats, while in Northern Ireland, Thompson Aero Seating has become an established manufacturer of premium aircraft seating.

As well as the design contribution, there are many factors that contribute to the creation and sale of a successful product, such as determination,



- 01. Thompson Aero's Vantage XL is due to enter airline service in late 2014
- 02. Acro's Superlight was initially designed for Jet2.com



strategy, contacts or funds. Although there are enough examples of businesses with these attributes that have brought products to market that should never have got there – Sinclair's C5, perhaps – in contrast, there are many great ideas that never make it to market, let alone successfully.

So you need a good idea, naturally, and you need determination and all those other things, but you also need design. Good design.

GOOD DESIGN Design means different things to different people. To EASA, a

design organisation is responsible for the design of aircraft and engines, and holds STCs, change or repair design approvals, or ETSO authorisations. Weighty stuff. While to some engineering departments, designers are the curtain pickers who turn up, draw pretty pictures, then swan off to the Arts Club... the truth is that good design lies somewhere between the two.

Good design is thoughtful, willing to question but aware of constraints, ambitious but not unrealistic, and champions the user (or passenger). It is sensitive to the ambitions and



GOOD DESIGN IS THOUGHTFUL, WILLING TO QUESTION BUT AWARE OF CONSTRAINTS



03. The start of a new era: JetBlue's Mint premium class

04. The Vantage seats in Mint are configured alternately as 2-2 or 1-1 private mini suites

preferences of the client, be they airline or vendor. Good design makes products (and the cabin) better: better for the passenger and crew, and better for the manufacturer and maintenance. Colour, trim and finish are essential, but so are form, function, interaction, comfort, ease of use, communicating the brand, providing enjoyment and making products and environments appealing. Design is the balance of all these things, but above all it is the thing that makes a difference.

Factorydesign has been supporting seating businesses, from the birth of

Thompson Aero's Vantage business-class seat and Acro's Superlight economy-class seat, helping each to turn a virtual idea into real products. The rise of these innovators challenges the industry's goliath suppliers and illustrates the benefits of embracing the values of design – flexibility, innovation and a willingness to give the customer what they want.

The introduction by JetBlue of a premium cabin in 2014 with a version of Vantage at its heart shows how the seat evolves again, continually improving, continually innovating.

Meanwhile, Acro's growth continues apace with an expanding customer base, including the recent additions of Thomas Cook, KLM Cityhopper and Saab. Both of these seating companies have embraced design and continue to reap the rewards for that vision.

Acro Aircraft Seating was set up to produce a bespoke seat that would enable low-cost airlines to benefit from significant savings in weight, and to offer improved passenger comfort, in particular, through increased legroom. Factorydesign was selected as Acro's design partner and the Superlight was

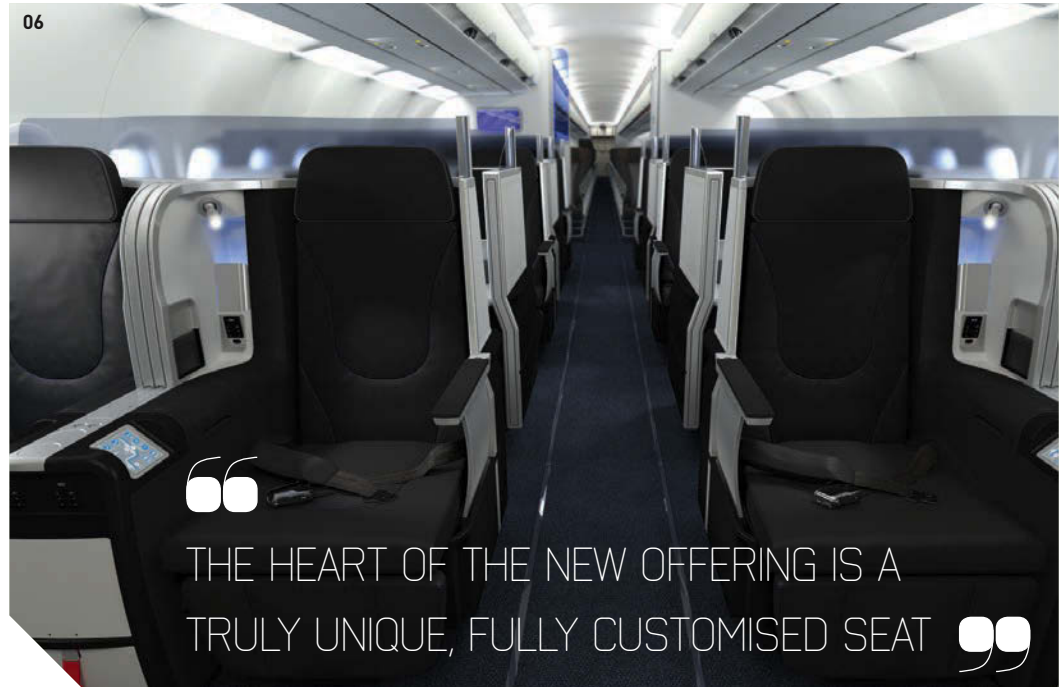


created for the launch customer Jet2.com. Designed specifically for short-haul, single-aisle aircraft applications, Acro's first production seat remains the lightest in its class, providing real fuel savings to airlines, more comfort for passengers and a significant environmental advantage.

Through the success of the design, supply and final realisation of the product, Acro has gone on to secure additional business and now has customers in the USA, UK, Lithuania, EU, Turkey, Russia and Italy. Building on this, the product range has grown to include long-range, reclining seats with seatback IFE and headrests for wide-body aircraft and short-hop seats for regional operators.

"Factorydesign brings refreshing creativity, invention and knowledge of trends and the aviation market. Acro would not have achieved what it has without them," says Chris Brady, MD of Acro Aircraft Seating.

Whether for long-haul IFE-equipped flag carrier seats, robust fixed-back seats aimed squarely at the low-cost carrier, or short-hop regional seats, Acro believes in good design that comes from the application of common sense, engineering rigour and practical experience of the service environment. The company's assertion that "the ultimate sophistication is simplicity" is an ethos that extends throughout the business. Meanwhile, customers embrace the benefits of the innovative design: the lighter weight reduces fuel burn; the ease of maintenance and low part-count are claimed to provide the lowest ownership costs of any aircraft



THE HEART OF THE NEW OFFERING IS A TRULY UNIQUE, FULLY CUSTOMISED SEAT

seat; and the considered ergonomics offer passengers improved comfort. Acro has seats flying on pretty much every airframe in service today, employs 60 staff based near London Gatwick Airport and produces more than 16,000 seats a year.

JETBLUE JetBlue, the New York-based airline, will launch an evolution to its onboard customer experience on its new A321 aircraft by taking the leap into the premium market. Working with San Diego-based design consultancy paulwylde to define the overall strategy for the JetBlue Mint Experience, the heart of the new offering is a truly unique, fully customised seat. Born out of the Vantage seat platform from Thompson Aero Seating, JetBlue worked with London-based Factorydesign to create a truly unique, bespoke seat.

"The geometry of the seat is complex, so we were delighted to have the talent of Factorydesign to produce a refined and sophisticated solution for JetBlue," says Gary Montgomery, CEO of Thompson Aero.

JetBlue and Factorydesign took advantage of the seat's unique staggered layout and created Mint Seats, which

- 05. Acro's Superlight is the lightest short-haul economy seat on the market
- 06. Factorydesign worked closely with Thompson to create the new JetBlue Mint products

are ideal for customers travelling with a companion; and the Mint Suite, which includes a closing door, for solo travellers seeking more privacy. This means passengers can select the seat that's right for them.

"While the premium market is new to JetBlue, this isn't really a departure from what JetBlue is all about. Our goal is to use innovative design and feature products that are truly purposeful for our customers. Without the Thompson seat and the skill of Factorydesign, we wouldn't be where we are today," states Don Uselmann, manager of customer experience at JetBlue.

A further innovation from Thompson Aero, designed with the help of Factorydesign, is the Vantage XL. This forward-facing premium-class seat offers a true 80in (that's 6ft 8in to most people), fully lie-flat bed at a 45in pitch. This exciting product provides direct aisle access for all passengers in a 1-2-1 cabin configuration across twin-aisle wide-body aircraft, delivering increased living space, an equalised passenger offering (every seat is the same) and seat widths up to 26in. Thompson Aero has announced sales to an as-yet unnamed customer, due to enter service in autumn 2014. ☒

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peoplecentric

It's time for customers to be at the heart of an airline. A new economy seat concept can help bring more comfort and flexibility, with less compromise



One of the cornerstones of Seymourpowell's philosophy is that you always start with people. When you approach any design problem with people at the centre, the first thing you must appreciate is difference. It's not so complicated, really, you just need to look around and it's easy to see a world full of diverse people of different shapes and sizes, with varying desires, requirements, tastes and expectations.

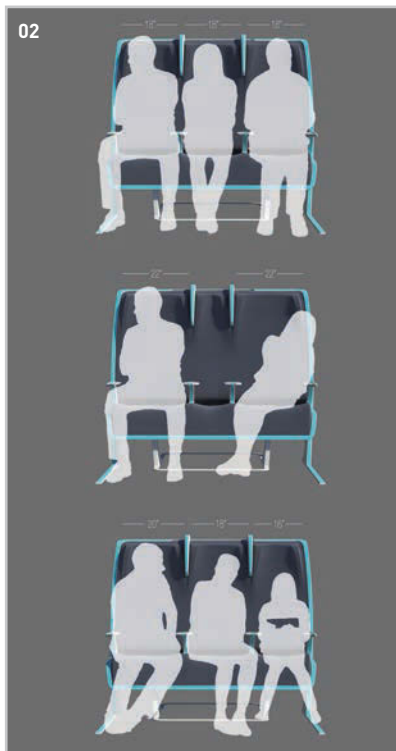
When you consider this in the context of moving people around on mass transit systems, the problem is complex. Passengers who can afford premium, business or first class have a choice and hence some control over their own experience. For those who travel economy, there is a very limited choice of alternatives.

Part of the problem is that airlines need to meet the needs of lots of different kinds of people with a standard product. The economy



01. Morph is intended to give passengers more choice over their space

02. The Morph concept enables many variations in seating configurations



seat is a perfect example of this. Ergonomically it has been designed for everyone by averaging the sizes of the largest and the smallest percentiles to a point where it fits relatively few people properly.

In this case, one size does not fit all – the design has been diluted down to the lowest common denominator.

The current trend of de-bundling the flight ticket so passengers can choose where to sit, whether it be in the aisle or by the window, is now commonplace in budget travel. Booking your seat is a must if you are over 6ft tall or large around the middle – anything to avoid the torture of sitting in the middle seat in the very back row.

But a passenger's size is only one factor; what about how we feel, our

emotional needs? The economy seat is ill-fitting here too. Let's consider the scenario of a young female travelling alone, a mother nursing a child, an elderly or less abled passenger, or a family travelling together.

Each scenario has specific needs: some passengers desire more privacy or security, some are more vulnerable and require greater assistance, while others only need entertainment. These needs change too, depending on the time of day, the length of the flight and the reason behind the journey. On the way out, the passenger may need to work, while on the way home they may want to relax or sleep. Yet we are all shoehorned into the exact same format, one that has remained unchanged for years. In other areas of our lives, the changes in the past 10 years have been



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THE BRAND IS NO LONGER AT THE
CENTRE OF THE EXPERIENCE. WE ARE ”

03



dramatic – how we work, how we relax, how we communicate with one another. Technically, from a materials, manufacturing and efficiency point of view, much of what will happen in the next 10 years is already on our radar. But how will people change, and how will these changing needs and demands segue into the future of air travel?

One thing is for sure. Having things ‘our way’, as consumers, as opposed to ‘your way’ as a brand, is fast becoming the norm.

The brand is no longer at the centre of the air travel experience. We are. And everything else will have to orbit that requirement.

So how can this thinking be applied to the economy seat? Surely there has to be a better way, a better economy experience. We are unlikely to get back

to the romantic age of air travel, but at the very least we should expect decent levels of comfort.

MORPH CONCEPT Morph is a concept economy seat designed by Seymourpowell that has been inspired by difference, new materials and flexibility. It has been designed to offer passengers choice over the amount of space they pay for and to provide a better fit for more people.

It is still a standard product, but it can adapt to the changing needs of the passenger. Morph uses smart architecture to adjust both the width of the seat, and individually control seat pan height and seat pan depth, to suit varying sizes of passenger.

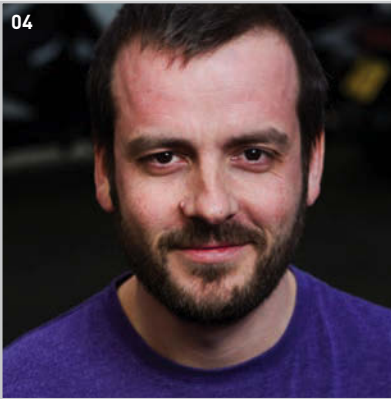
It works by replacing traditional foam pads with a fabric that is

stretched across the width of three seats, around a frame and over formers. One piece of fabric is used for the seatback and one is used for the seat base. The fabric is clamped down by the armrests and the upper dividers to form three individual hammock seats.

By moving the formers and pushing them through the fabric, the recline and a large range of ergonomic adjustments can be controlled, morphing the fabric to provide a tailored fit and greater comfort.

As the recline happens within the soft furnishings, the solid seatback does not move. The semantics of the architecture and visual cues indicate that the back of the seat belongs to the passenger facing it. Passengers can extend the width of their armrests over their own lap, increasing that feeling of

03. Width, and seat pan height and depth can be tailored to each passenger



04. Jeremy White,
head of
transport
05. Morph's inner
mechanisms
06. Three individual
hammock seats
can be made



ECONOMICALLY SPEAKING, THIS IS A REVOLUTIONARY
PROPOSITION FOR TRAVELLERS

independence and control over their own space.

As just one sheet of fabric is being used across three seats, the dividers can be unclamped and moved laterally, clamping them down in a different position and so adjusting the width of each individual seat. Families travelling together can tailor their seats according to size; for example a mum and dad with an infant could pre-book a large, medium and a small space.

The mechanism and formers move too, so the comfort, recline and adjustability are all maintained. A properly fitted seat is not only more comfortable, but safer, and it reduces health risks.

Economically speaking, this is a revolutionary proposition for travellers. Smaller travellers or children could buy a space and a seat fitted specifically for them, and a cheaper ticket. They could sell or trade their inches to larger passengers who want more space, the business traveller prepared to pay a bit more so he can work, or the mother nursing her child who wants more privacy.

The premise is that if the economy seat could adapt to differing people's size, then comfort levels could increase without a reduction in capacity.

In addition to this, the ability to move the divisions laterally, adjusting the width of the seat while maintaining the amount of recline and the comfort level, allows airlines to change a row of three into a row of two, moving quickly from a high-density economy ticket, to a lower density, more premium ticket.

For the airline, this creates a scalable value offer, enabling them to arrange the economy cabin by



passengers' willingness and ability to pay for space, blurring the boundaries between the classes.

For the passenger there is the added value of having a choice. They no longer need to buy a seat, they can now buy space, gaining control over their experience in a seat that fits them with individual, tailored comfort control. Seymourpowell believes the future of air travel is personal... even in the cheap seats.

Visit the Seymourpowell YouTube channel at www.youtube.com/seymourpowell to watch a video on the Morph seat concept. ☒



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The shape of things to come:
making things better for people,
better for business,
better for the world.

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
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designdiversity

A broad experience of design, including aircraft interiors, hotels and rail, is leading to some modern design classics

 Some design consultancies may talk a good game about their potential to deliver wide-ranging transport design solutions, but London and Singapore-based James Park Associates has more than three decades' experience of actually making them happen.

This doesn't just benefit the premium and luxury high-profile clients who define today's products and services. It benefits future generations of products too, as JPA's founder James Park explains: "We really understand what high-end customers expect from a complete travel experience. Over 30 years, we've gained a broad knowledge in designing not only airline seats, but also airport lounges, luxury trains such as the Orient Express, plus five-star hotel lounges. These are often tight spaces that require good design to make the high-quality service work within them. We feed these insights back into projects like the new Singapore Airlines business class seats."

DESIGN APPROACH JPA's identity is grounded in its ability to deliver innovation, harness its creativity and then channel it into designing effective, real-world solutions. Equally important, each of the agency's customers receives solutions that are wholly bespoke, carefully crafted responses to their particular aspirations and requirements.



01. Almost every element of the latest Singapore Airlines business-class seat has been redesigned
02. The senior level JPA team. From left to right: Ben Orson, John Tighe, Tim Manson and Alex Duncan



The unusually broad skill-set and experience JPA can draw from has benefits that extend in both directions, as newly appointed managing director Ben Orson reasons: "The hospitality sector's relatively unconstrained ability to give expression to the concepts and desires of its customers has always provided a defining reference for creating vehicle interiors. Similarly, some of the more progressive elements of the hospitality sector draw inspiration from the techniques, solutions and materials commonly found in aerospace and rail."

Park is keen to make clear that JPA isn't just a 'pretty pictures department' or a 'blue sky ideas' agency, either. "We're not just about styling," he emphasises. "Our office is made up of

architects, interior designers, product designers and project managers. We have the capability to take a project all the way through to its completion, and to protect the integrity of the design in the process."

Another major string to JPA's bow is its thorough and clear approach to business. "We are straightforward to deal with," says Orson. "Our language is open and honest and we avoid jargon. We understand that our clients think long-term and we build our relationships on the basis of clear understanding and communication."

RECENT SUCCESS In the past year, this approach has led to the delivery of many new projects, including new cabins for Singapore Airlines and



TIGHT SPACES REQUIRE GOOD DESIGN TO
MAKE THE HIGH-QUALITY SERVICE WORK



of positions, whether that's on your back, front, or on the side where the knees tend to be angled outwards, often causing clashes on lesser seats."

Two other key aspects of the new Singapore Airlines seat – colour/trim and feature layout – illustrate JPA's expertise and client understanding. Firstly, the sumptuous materials, stitching and fit on the seat are a direct result of JPA's team of in-house textile designers, who are experienced in weaving, pattern making and texture design. These details are really noticeable when you spend time in the seat – as long-haul business passengers inevitably will.

Then there's the human story of Singapore Airlines' humble new cocktail tray. On the existing seat it is positioned on the aisle, but one of the issues the cabin crew encountered was that occasionally passengers knocked the tray when entering or exiting the seat area. The obvious solution was to put the tray on the centre console – it's what most airlines do – but because the Singapore Airlines seat is very wide, it's hard for the cabin crew to reach across, so JPA came up with a position next

to the monitor to allow the cabin crew to serve into the space without getting too close to the passenger. The beverage is also subtly lit from above to give the item served real importance and elegance. As Tighe explains, "This design solution reflects JPA's great knowledge of working with the brand and an understanding that the star of the show is always Singapore Airlines' service. Everything else is a conduit to that."

Chew Tai Lu, Singapore Airlines' vice president product innovation, summarises, "Designing for cabin products is indeed a long journey. JPA fully understood Singapore Airlines' design philosophy, the importance of integrating customer service into the design and the need to be extra flexible for the various changes and fine tuning, even at the last minute."

JPA's involvement with American in redesigning the airline's cabin interiors was a massive project with concurrent and demanding timelines made manageable through JPA's straightforward and engaged approach, combined with American's clarity and timeliness of communication.

03. The finishes for the new Singapore Airlines business-class cabin were carefully selected to complement each other

American Airlines, and hospitality work for the Amara group.

JPA's new business seat for Singapore Airlines is a great example of the consultancy's continuous search for innovation. Building on the success of its original 2006 design, the basic cabin layout remains, but almost every element of the seat has been redesigned. Beyond a more dynamic and curvaceous look, a key change is in how it functions.

"It's unique in now having two recline positions," says design director John Tighe. "What we call the 'Lazy Z' cradle position plus a 'Sundeck position', where the customer can stretch their legs out onto a large flat surface in front. The unique bed shape also suits people who sleep in all sorts



04



WE WORKED WITH MORE THAN 10 SEAT OR FURNITURE MANUFACTURERS AND ON EIGHT AIRCRAFT TYPES



“The scale of American’s fleet is vast,” says design director Tim Manson. “Within the project, we worked with more than 10 seat or furniture manufacturers and on eight aircraft types, customising functions and specifying appearance, colour and texture, for thousands of parts. This required great care and attention to detail, but was hugely satisfying as it brings some outstanding new products and an impressive consistency to one of the world’s leading airlines.”

Away from aircraft, JPA’s design of Amara Hotels’ first venture outside its home country of Singapore – the Amara Signature Shanghai – was a recent highlight made easier by JPA’s extensive knowledge of the Far East. This sizeable, mixed-use development – currently under construction – will eventually comprise a 26-storey, 360-room, five-star hotel, podium retail mall and class-A commercial tower at a prominent location. With JPA’s 20-year presence in Asia, it is well-placed to fulfil the client’s desire to subtly reflect its Singaporean heritage against a backdrop of contemporary Shanghai.

LOOKING FORWARD Although JPA is proud of its in-house abilities, it is also excited to collaborate with other expert partners in joint ventures run in parallel with customer-specific projects. Over the years, these have generated a number of successful products, several valuable patents, and a steady stream of ideas, insights and realisations that feed into other work.

The most visible recent example of these is the Cirrus business class product developed with Zodiac Aerospace, which launched with US Airways in 2009 and has been flown by Cathay Pacific, American, Delta Air



05

- 04. The new first-class seat on the latest American B777-300ER
- 05. The striking bar area on the latest American B777-300ER also serves as the entranceway

Lines and EVA Air. There are products that owe their success to a brilliant insight and those that owe their success to weeks of painstaking exploration of a range of possible responses to a situation. Cirrus belongs to the latter group, but with hindsight it is obvious that the ease with which Cirrus combines direct aisle access, privacy, comfort, density and, critically, a peerless ability to adapt efficiently to each airframe, marks it out as an outstanding solution. There are now many thousands of these seats in the air and it continues to be selected by some of the world’s top-tier airlines.

In the past year, JPA’s designers have teamed up with Jamco to create another exciting business-class product, which made its debut at the

2013 Aircraft Interiors Expo in Hamburg, offering a step-change improvement in overall space and comfort. The level of interest is extremely encouraging and JPA and Jamco are now working with a number of airlines to develop the product.

Looking further ahead, JPA is working with one of the world’s leading academic institutions – which for now must remain secret – with the objective of pursuing more experimental directions for future designs.

JPA’s wide-ranging design skills and vision, allied with carefully fostered customer relationships, make it well-placed to continue pioneering and transforming the fields of aircraft, rail, hotel and hospitality interiors for decades to come. ☒

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“Designing for cabin products is indeed a long journey. JPA fully understood Singapore Airlines design philosophy, the importance of integrating customer service into the design and the need to be extra flexible for the various changes and fine tuning, even to the last minute.”

Chew Tai Lu

Vice President Product Innovation
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JPA

James Park Associates
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


Singapore Airlines Business Class

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sharedspaces

Luke Pearson and Tom Lloyd's creative approach to design has seen the PearsonLloyd studio produce two award-winning airline seats in the last decade

 Luke Pearson and Tom Lloyd set up their studio in 1997. Since then, PearsonLloyd has designed furniture for Walter Knoll; carried out wayfinding for the heritage city of Bath; addressed violence in A&E wards; and become a specialist in task chairs, developing products for companies such as Steelcase.

The breadth of work is clearly wide, but the studio's goal is always the same: to respond to the changing patterns of behaviour in contemporary life, and materialise its research with products strong enough to shift the market.

To date, the studio's portfolio has seen it awarded the distinction of Royal Designers for Industry by The Royal Society of Arts in 2008; and in August 2012, it was named one of the top 50 design studios 'Shaping the Future' by *Fast Company* magazine in New York.

Design writer Anna Bates talks to Luke Pearson and Tom Lloyd about the ideas that shape the studio's work.



- 01. Lufthansa's business seat was designed completely from scratch
- 02. The process map that PearsonLloyd created for UK NHS A&E departments

AB: The past decade has seen you transfer your skills to aircraft seating. You've now designed two award-winning seats in the business-class sector for both Virgin Atlantic and Lufthansa and consulted for Star Alliance. What do you like about working in this field?

LP: We're interested in designing for shared spaces. It's kind of a black art: there's this dichotomy between the needs of the individual and the needs of the group. We have to deal with the psychology of people.

each other in shared spaces: such as your work addressing violence in A&E wards; and the shift in the way workers use office space, for Bene.

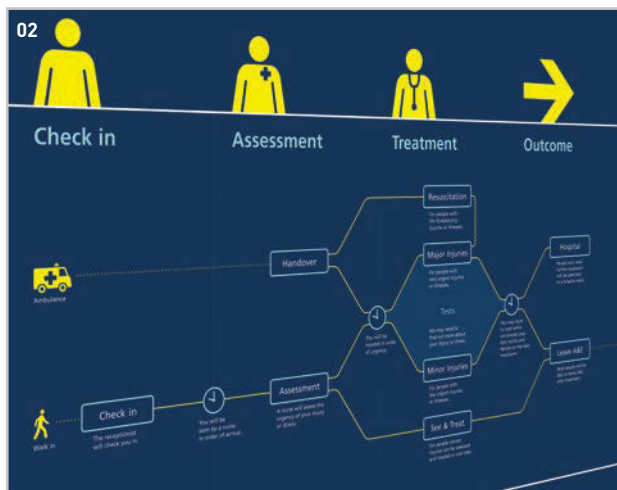
TL: With all our airline projects, we've brought a culture of furniture design to a sector that has been dominated by product and industrial design. Actually, bridging the gap between these two disciplines has been our goal from the start: we studied both disciplines, and we set up the studio to address the disconnect between the two.

LP: There is a different dynamic in all of these projects, but the goal is always to create environments that encourage certain behaviour, by making it feel natural. Getting this right is the difference between someone having a good experience and a bad one.

AB: How have these ideas materialised in your work for airlines?

TL: We did a lot of research when we were designing the business-class cabin for Lufthansa, and we discovered that

AB: More recent projects see you tackle the issue of how strangers interact with





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WE DESIGNED A SEAT SPACE THAT SUITED THE BRAND'S CHARACTER”



people experience a sense of privacy if their head and shoulders are further apart – it doesn't matter if their feet are close together. We built this into the seat plan by using a 'V' configuration.

AB: So these big ideas are prevalent in the smallest details?

TL: Yes. What's really good about this design is that if co-travellers want to talk, they just need to tilt their heads forward slightly, and because they are positioned diagonally, they find themselves facing each other.

LP: A lot of airlines apply branding a bit like a sticker, but both Virgin Atlantic and Lufthansa knew that

buying off-the-shelf products and simply re-dressing them wouldn't do. It's in the details that you can express the values of a brand – and this is how you create a memorable experience. *Wallpaper** magazine recently wrote that our Lufthansa seat was its favourite – for all these reasons.

AB: When you designed the upper-class cabin for Virgin in 2003, you saw 'experience' in more theatrical terms.

LP: This project was all about breaking new ground. It was the first time a completely flat bed had been designed in this format, and Virgin wanted to take the opportunity to re-position the brand. We designed a seat space that

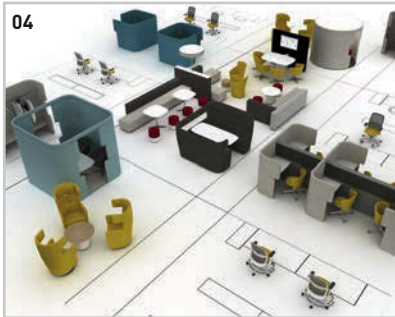
suit the brand's character; Teague described it as having a "clubby sexiness".

AB: It also introduced a new aesthetic language into the aircraft cabin – critics said it brought Virgin into the realm of a design-led brand.

LP: The seat became iconic; it's one of the few airline seats that is known outside of the airline industry. When we designed it, aircraft seats looked like they were made for racing cars.

TL: We thought: you go from hotel to hotel via this seat – why does it look like a machine? We stripped away the unnecessary technology and made the

03. An attractive and informative wayfinding post in Bath, UK



seat more discreet so people felt like they were taking off in a lounge chair.

AB: Would you say that the market has changed now? For starters, the consumer is smarter – there are even websites that enable passengers to review each seat of an aircraft.

LP: Absolutely. It isn't just about big gestures anymore. Our clients – the passengers – are very educated, and much more critical.

TL: It's become about the nuances. Especially as the market is very developed – there are a lot of lie-flat seats. The challenge is to do something that adds a different kind of value.

AB: You've credited the collaborative process of your work for Lufthansa as the reason you were able to achieve such a high level of detail. But was it difficult to maintain a strong vision with so many people involved?

LP: We love this bit – we have a gestalt philosophy of how the part we're working on affects the whole, so we get involved with all the teams in the project: engineers, accountants, upholsterers. We have to know how different groups behave, because to design something well you need to be able to bring bits of information from one environment to another.

AB: What about with the client?

TL: There can be a bit of a wrestle, because our priority is always the end user. But we really enjoy the tension around this relationship.

AB: You have created long-standing relationships with many of your clients



IT ISN'T JUST ABOUT BIG GESTURES ANYMORE. OUR CLIENTS – THE PASSENGERS – ARE VERY EDUCATED AND MUCH MORE CRITICAL



– like Walter Knoll, Bene and Tacchini. You've also been commissioned by some of your clients to work on completely different projects: Joe Ferry, previously head of design at Virgin and senior vice president of design at InterContinental, recently commissioned you to work on hotel projects based on your work for Virgin. He said you were an “exceptional creative team” and that your “versatile talent made it an easy choice”. What do you think the reason for your repeat commissions is?

LP: We care, and we bring this to all our relationships. It's a really simple thing, but it is related to everything we do. To a degree, we see ourselves as servants of the brand; over time we've become really good at stepping into the client's world and understanding what

- 04.** PearsonLloyd has designed a wide range of office furniture and enclosures for Bene
- 05.** The Riya task chair, designed for Bene

is relevant for them and how they need to develop.

AB: You've described your ability to navigate the relationship with the client and all the other parties involved as part of the “craft of industry”.

TL: We see the craft of industry as the ability to manipulate the tools at our disposal, work with the restrictions of the factory, the market, the client, the engineer, the materials and the price – all the things that aren't usually spoken about when you talk about design.

LP: This is the lifeblood of our design process. It is a process driven by passion: we can spend months tweaking it. When we succeed with this equation, the result is something efficient, beautiful and memorable. ☒

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
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creativespace

Zodiac has created a different kind of studio, which is continuing to refine a more immersed design and innovation process

 ZEO, the design and innovation studio of Zodiac Aerospace, takes a different approach to creating compelling designs and innovative interior products. While pure industrial design talent will always be paramount, the environment and team surrounding those designers can make the real difference.

For this reason, ZEO also includes a dedicated team of talented advanced concept engineers and one of the most capable prototyping and mock-up shops in the industry. These elements are housed in a customer-inclusive, collaborative environment, designed specifically for creating tomorrow's interiors. The basic premise followed and applied by ZEO is quite simple: deeper immersion with its customers allows for a more optimal solution, faster time to market, and a more complete realisation of the original vision. And, to go deeper, ZEO is built differently.

CUSTOMERS AND PRODUCT The initial ideas phase of any project has a strong emphasis on challenging preconceptions, focusing on a clear understanding of context, functional

01. The ISIS (Innovative Space Interior System) was a result of ZEO's commitment to design, engineering and prototyping
02. The ISIS lav is elegant and space efficient





DEEPER IMMERSION WITH CUSTOMERS
 ALLOWS FOR A MORE OPTIMAL SOLUTION



needs and usability. Thus equipped, the team can dive into building the best solutions. To enable true innovation beyond incremental improvement, ZEO believes that it is critical for the team (including both customer and ZEO) to have real solutions quickly available to evaluate and refine. To accomplish this, ZEO emphasises a high-visibility, hands-on design process with intensive sketching and visualisation of ideas, early engineering engagement, and most importantly, rapid, iterative prototyping as a core approach to innovation and product creation.

As Scott Savian, head of ZEO, explains, “When creating a step-change product, the customer, our team and the product need to be in the same room very early on, and then, throughout the process. Our extensive rapid prototyping capabilities make that possible. We strive to fail early, often, and inexpensively; continue to iterate and refine. The result is better products.”

DESIGN-BUILT STUDIO In 2013, ZEO moved into a new, purpose-built 3,000m² design and prototyping centre in California. The flexible new studio visibly embraces the ZEO way of

03. Prototyping plays a key role in the ZEO process



working, enabling the industrial designers, advanced concept engineers and customers to work together in dedicated project teams, with easy and continuous access to the adjacent prototype shop.

“Our new collaborative studio environment is a revelation. Co-location of project teams with access to the broader envelope of Zodiac expertise, combined with deeper customer involvement and our rapid proof-of-concept process, is a real step forward for our industry, enabling us to bring true value-added solutions to our customers much faster than I would have believed possible,” says Ian Scoley, industry veteran and VP of industrial design at ZEO.

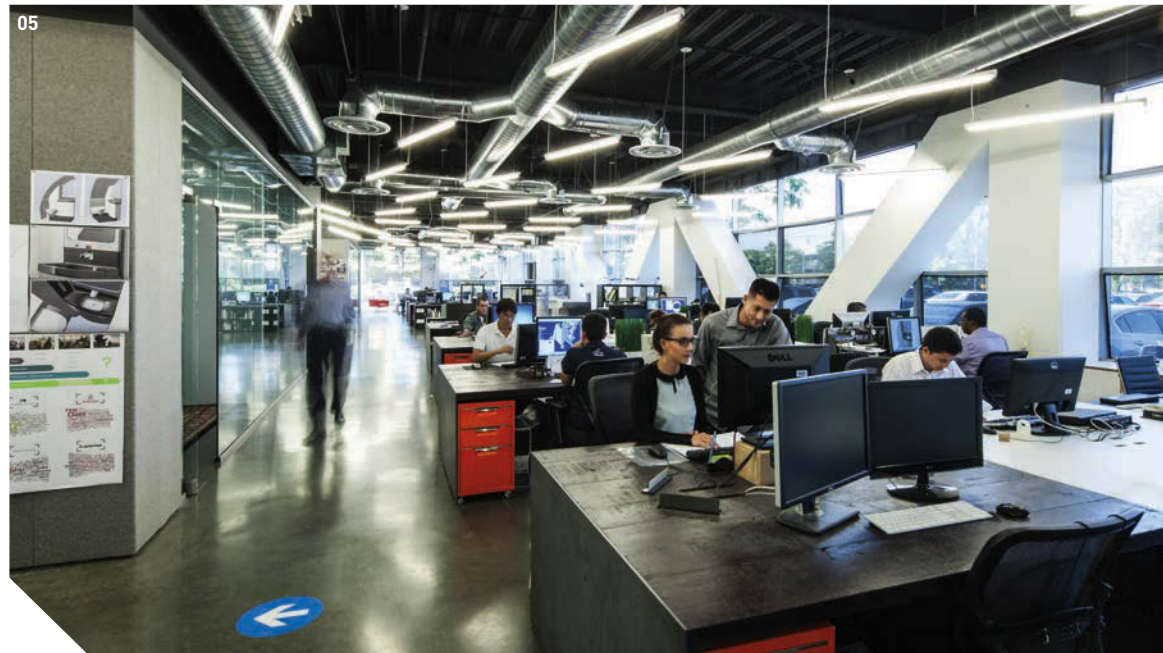
REAL RESULTS While ZEO takes a decidedly different approach to innovation and product development, the ‘additional’ steps (engaging engineering from the start, producing multiple prototypes and iterating the design), produce tangible benefits beyond simply improving the end solution. They also enable a more realistic chance for the concept to be fully realised as originally conceived, and actually shorten the development time required.

While this may seem counter-intuitive, the process enabled by ZEO’s broader capabilities allows for these activities to happen in parallel. This is where the time savings are achieved, while the concurrent engagement of all key parties from the onset helps ensure robust execution.

The results can be clearly seen in a major recent ZEO project – the ISIS A320 interior. While this project was appreciated by the industry as a visionary concept (winning the 2013

“

WHILE GREAT NEW PRODUCTS WILL ALWAYS CONTINUE TO BE DEVELOPED, THE ABILITY TO REALISE BIGGER LEAPS MORE QUICKLY WILL BE A HUGE ADVANTAGE ”



04-6. The purpose-built studio welcomes coworkers and customers alike into a collaborative, project-based environment

Crystal Cabin Award for Industrial Design & Visionary Concept, and the 2013 Red Dot for Design Concept), the rapid, robust ZEO development process enabled very quick completion by Zodiac Cabin Interiors. This product will be certified and flying with multiple customers in the next six months. While great new interior products will always continue to be developed, the ability to realise bigger leaps more quickly will become a huge advantage. In an industry where ‘concept’ and ‘visionary’ typically translate to ‘will never happen’ or ‘years later we’ll see a watered-down version’, ZEO’s ability to help quickly realise step-change product solutions could be the real revolution. ☒



Web: www.zeostudios.com

Think Beyond Design




Think Innovation

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creativeprocess

A Paris-based design studio is striving to create exciting cabins that add a little more imagination to the catalogue offerings

 Cabin designs are becoming more and more personalised, whereas just a few years ago airframers delivered aircraft along much more uniform lines.

The modernisation of fleets and competition between airlines has led to a reconsideration of seat, galley and lavatory design, and a market previously limited to a few timid innovations has now opened for specialist aircraft interior designers, who can offer airlines designs that correspond to their image. During the last Aircraft Interiors Expo in Hamburg, visitors could see the research being carried out by architects specialising in custom solutions to encourage manufacturers to take the initiative in this domain.

Pierrejean Design Studio has followed this approach since 1998, convinced it is the way to achieve the optimum balance between the production costs of equipment and passenger comfort. The studio's first studies focused mainly on the first-class environment – not just on the seats' ergonomics, but also the functions and the surrounding storage.

These first concepts necessitated the involvement of aircraft manufacturers, which had to adapt to the demand. Next, convivial zones appeared around the seat: bar corners, buffets and



01



02

“

THE MOST DIFFICULT WORK HAS YET

TO BE DONE IN ECONOMY CLASS”



a modernisation of the lavatories that can go as far as incorporating shower cabins. Since then, the galley, originally very technical and hardly convivial, has become something intended to be more sociable, treated as a modular space, from its appearance during boarding, through its true function as a space allocated to the crew, to becoming a place for passengers to meet at the end of the service.

01. One of the most headline-grabbing A380 features: Pierrejean worked on the Emirates A380 showers
02. A yin-yang galley concept that is ideal for meeting and relaxing

REAL-WORLD EXAMPLES For its concept of Mini Suites created in 1998 for Emirates, Pierrejean Design Studio worked with B/E Aerospace on the development of the seat module, bringing together the intentions of the designer and the airline, the certification requirements, the integration inside the aircraft and the economic success of the final product. This concept, which was highly innovative at the time, was originally strongly criticised for its private aspect. However, Pierrejean Design Studio can affirm the success of this much-copied product, the name of which has become synonymous with comfort in the world of cabin specification.

Similarly, when Pierrejean Design Studio conceived a design for Etihad based on the Solstys business-class seat from EADS Sogerma, the cabin layout had to be re-thought in order to better integrate the concept, which offers each passenger direct aisle access and a perfectly horizontal sleeping position. More than 8,000 examples of this seat have since been sold, making it a bestseller for its category.

Conscious that the most difficult work has yet to be done in economy class, Pierrejean Design Studio has looked into a high-density solution for certain routes, countries and types of aircraft, alongside a more conventional vision of this class.

Toilets can be found all around the premium zones, and the studio has



carried out a study for Jamco to explore a new arrangement where men and women can cohabit. With this concept, a urinal and a bidet appear and then disappear, in a revolving design that is intended to be easy to maintain and very hygienic to use. This sensitivity that Pierrejean Design Studio brings to passenger comfort can also be seen in the shower facilities onboard Emirates' A380 fleet.

Developed in collaboration with Airbus and Dasell, the layout at the front of the upper deck provides one of the best occupation ratios for this zone. Like every architect imagining life inside, the studio wanted to invest in the service area to make it more attractive both for passengers and the teams who work there. Treated like an open kitchen, the galley opens on to the commercial cabin, becoming a place for meeting and relaxing, and is harmonious with the surrounding cabin.

In the context of the B787 Dreamliner for Qatar Airways, Pierrejean Design Studio wanted to open up the entrance to the aircraft in order to offer passengers a real welcome worthy of a hotel lobby. Buffets incorporating trolleys in the lower section were designed for AIM. The trolley itself, part of the company's identity, was the subject of extensive research, which adds to the appeal of duty-free shopping when it passes through the cabin.

This work has become more and more essential for airlines, which, with



AIRLINES, WITH THE HELP OF SPECIALISTS, HAVE TO CONSIDER INTERIOR DESIGN AS PART OF THEIR COMMUNICATION PLAN



the help of specialists, have to consider interior design when communicating their design plans. In its work, Pierrejean Design Studio continually reflects as much on the concept of specific products as on the optimisation of cabin layout. The studio is currently working on a study of the interior trim of a cabin's interior panels in order to offer further personalisation for airlines.

All of this is coordinated with the aircraft manufacturers, which, for their part, seek to minimise choices in

03. The studio has worked on lav concepts with Jamco

04. Pierrejean's vision of a high-density, economy-class seat

creating catalogues of standard products. However, cabin designers have the know-how to develop and present these products to achieve the best compromise between concept, quality and price.

The merging of suppliers has the potential to limit creativity in the future, but the perseverance of Pierrejean Design Studio over the years in this profession has helped perpetuate the momentum of innovation for the passenger's wellbeing. ☒

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SYNERGETIC DESIGN...




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feelspecial

The sky is not the limit for airline brand differentiation, say Tangerine's directors

 "I have a great respect for incremental improvement," Steve Jobs told *Rolling Stone* magazine in 1994. "But I've always been attracted to the more revolutionary changes."

The founder of the Apple empire could have been speaking on behalf of a generation of creatives frustrated by cautious corporate culture. It is an argument often made about those who compete for custom in the skies.

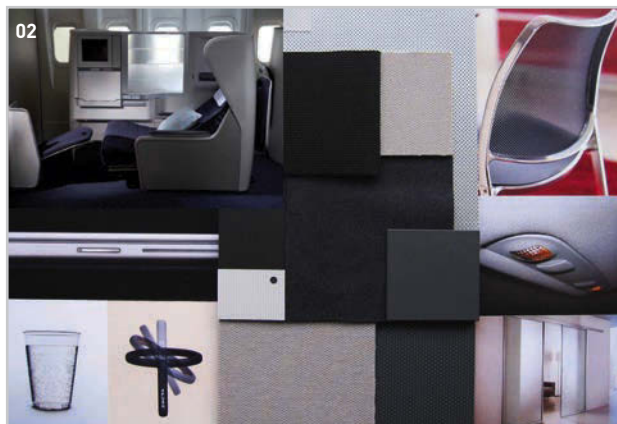
Airlines are permeated with a safety-first philosophy. Every flight begins with advice to keep seatbelts fastened at all times, a metaphor perhaps for a cut-throat industry where one imprudent decision in the boardroom can lead to financial disaster.

But caution can also lead to inertia, and any pilot will tell you that flying needs sufficient forward movement. The aviation industry can find itself torn between the fear of flying too fast and the fear of flying too slowly.

One can see this tension in the way airlines approach the development of the passenger experience. It is widely accepted that brand differentiation is key to commercial success, but while for some that means re-upholstering the seats, for others it means constantly re-thinking the way we fly.

"Our revolutionary eight-abreast yin-yang seating layout for British Airways Club World changed the game

01. First class on BA's A380 has 30% more space with no loss of cabin density
02. The inspiration board for the second-generation BA Club World



in business class when it was launched in 2000," says Martin Darbyshire, managing director of Tangerine.

"It was a huge investment for BA, but the gamble paid off handsomely. The new cabins became the profit engine of the business and contributed massively towards protecting BA's leadership position in the market."

But Darbyshire worries that the industry is restricting the room for innovation, both figuratively and literally. "The airframe makers are placing stringent limits on the potential level of change in the aircraft interior," he says. "The choice of available seat-types within the catalogues is limited and the scope for customisation is becoming vanishingly small."

Tangerine's creative director Matt Round shares Darbyshire's concern that design ambition is being compressed. "Unique products are possible but they need vision, commitment and planning. They need to be iterated, loved and negotiated into life," Round argues. "Virgin and BA have both proved that if the brand has the motivation to deliver a unique product, it can be done."

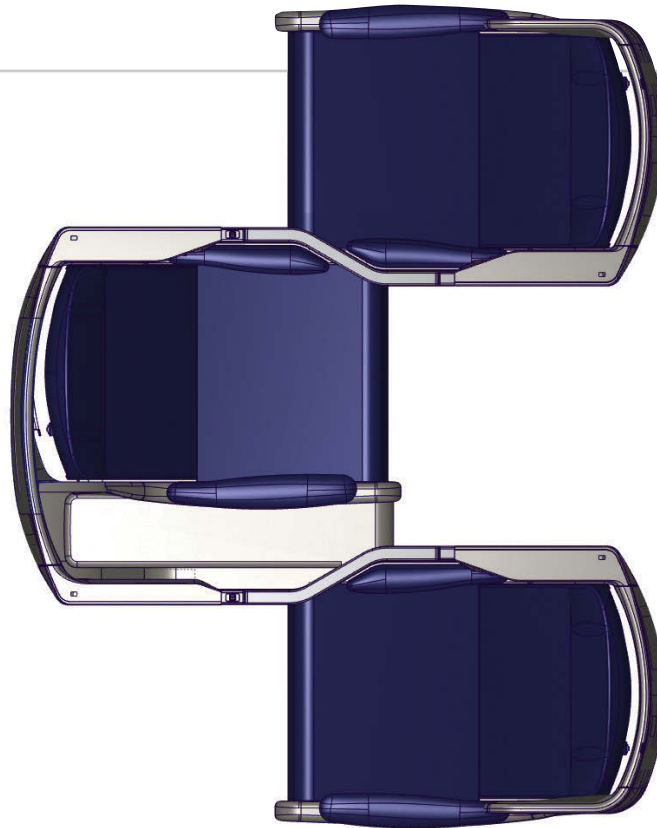
COLOURFUL APPROACH For many airlines, though, the preferred route to brand differentiation is via CMF – colour, material and finish. It is about interior design in a narrower sense, updating the look and feel of the cabin without touching the fundamentals.



IF THE BRAND HAS THE MOTIVATION
TO DELIVER A UNIQUE PRODUCT,
IT CAN BE DONE



03



03. A 3D model of the new yin-yang-yin configuration in Club World

“CMF can transform the perception of a brand,” Darbyshire accepts, “but what it will struggle to do is genuinely give passengers a better experience.”

The appeal of the CMF approach is that it can be achieved relatively cheaply and quickly, and designers recognise that in some circumstances it is the best option. For Darbyshire, though, there is a concern that it is too often seen as the only option.

“The industry needs to be careful,” he warns. “CMF is attractive in that it protects delivery schedules, but good design in the right hands can also happen on time.”

Tangerine identifies three attributes that should be brought to even the most straightforward cabin makeover:

strategic thinking, exhaustive enquiry and attention to detail. “It has been our ability to think strategically, ask the right questions about the real issues, and then identify how to shape a concept that has created some of the most significant innovations in airline interiors,” says Darbyshire.

UPDATING A CLASSIC After the success of the yin-yang seat design for BA’s Club World cabins, Tangerine was invited to update the concept in 2006. “This was evolutionary rather than revolutionary change,” Darbyshire points out, “but it still redefined comfort and privacy for the business-class passenger and made an already great product even better.”

By starting with a determination to make the traveller experience better, rather than just different, Tangerine has found itself hunting out opportunities for innovation. They have worked closely with seat and cabin equipment manufacturers to create and deliver solutions that really respond to the aspirations and needs of the passenger.

For example, Tangerine found a way to maintain 14 seats in BA First while expanding the personal space of each passenger by a remarkable 30%. Turning such imaginative design into tangible product, according to Darbyshire, required deep co-working with the manufacturer. “We were determined to avoid the frequent problem of a designer creating a pretty



picture and then haggling away for ages trying to convert it into a realisable physical item,” he says.

“A similar approach with B/E Aerospace led to the design of a new triple version of the Club World seat that has just been launched on BA’s fleet of A380s,” says Darbyshire. “We’re calling it the ‘yin-yang-yin’.”

The new arrangement offers a wider than standard seat for passengers in the centre rows of the aircraft, and initial feedback suggests that yin-yang-yin could prove very popular. It is another example of the importance of keeping the ultimate aim – improving passenger experience – uppermost in the minds of those guiding the project.

The yin-yang-yin is also the child of a design philosophy that believes in learning from experience. Studying the way passengers used the previous yin-yang seat revealed how some of the functions in the pioneering footstool were rarely used, so the new version offers a more streamlined approach.

Wooing business passengers is the critical battle for many airlines. Finding ways to design in an atmosphere and environment that makes such travellers feel valued may be the difference between success and failure.

ANOTHER VIEW A recent successful project for Heathrow Express threw up a similar challenge. The train operator was concerned that a planned refit for its first-class carriages didn’t look different enough from the standard accommodation. They had seen Darbyshire explain his approach to the redesign of BA Club World and First, and asked Tangerine to step in.

“First-class passengers are paying a premium and need to feel special,” explains Round. “So we suggested



THERE IS A LOT OF TALK ABOUT SERVICE DESIGN AT THE MOMENT, BUT MOST OF IT IS STILL HOT AIR



something unheard of in train design – reducing the number of seats. Then we added a CMF that aligned the first carriages with high-end airline cabins. The extra space meant passengers had everything at their fingertips: luggage close by and a space for devices and drinks. It all came together to give an exclusive feel that actually increased occupancy, but it needed belief and commitment from all parties involved.”

It is the same story in the air. Passengers who have paid extra for their seat need to believe they get extra respect when they step on board. For Round, service is a relatively untapped area for delivering differentiation.

“There is a lot of talk about service design at the moment, but most of it is still hot air,” Round says. “There is real variation – depending on the airline. Most will give business passengers a

04. As some functions in the Club World footstool were rarely used, they have been removed in the new generation
05. Central occupants benefit from a little extra personal space

glass of chilled champagne or fresh orange juice when they get on board. Yet some will barely give them a smile.”

Once again it is the passenger experience that dominates Tangerine’s thinking. “The devil is in the detail,” Darbyshire says. “We need to think hard about the little things that can be the difference between enduring and enjoying a flight – minimising frustrations and maximising the freedoms that matter to passengers.”

The message to airlines that feel more comfortable with incremental change is clear. Revolution in aircraft design isn’t necessarily only about ingenious new seating or radical layouts. It is about the pursuit of something much more straightforward: the profound sense of pleasure that envelops a traveller when they have been made to feel special. ☒

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Image showing British Airways Club World 2nd Generation 2006

futurefaith

Creative dialogue and development can bring alive interior ideas that delight passengers and reward brands



Our future isn't a foreign land where magical things happen. If you happen to think this, then all it means is that most of us "live in a state of manufactured normalcy", as Venkatesh Rao put it in *Welcome to the Future Nauseous*.

In fact, it could be argued that the future is what we experience now. It may seem rather blasé when one thinks about the fact you're waiting for a text message as you're reading this very article. When was the last time you thought about the device that receives that text? What have you done lately on that phone, which can access the largest repository of human knowledge known to date?

We live in a world of ubiquitous computing and information where people can control cybernetic limbs by thought. The magic, if that's what you call it, comes from the collaboration, imagination and conversation that leads from one good idea to another, more brilliant one.

One of the things we've done in the Advanced Design Group is to create an environment where this magic happens. We are engineers, specialists, and industrial and graphic designers – embedded in a space where the daily conversation revolves around experience, usability, brand and manufacturing. We are fortunate in



01. A rendering of a BEAD business-class concept

02. B/E Aerospace's Super Diamond forms the basis of Qatar's B787 business seat



having space in a state-of-the-art centre, where such conversations become physical and working ideas.

This conversation extends to our airline partners in order to create dialogue. Dialogue is important. It is through dialogue that people are engaged, discovery begins and ideas take form.

Our process begins with this dialogue, gathering the relevant insights that enable us to have a well-informed point of view. This enables the Advanced Design Group to understand the commercial needs of

our airline partners and the usability and comfort needs of passengers.

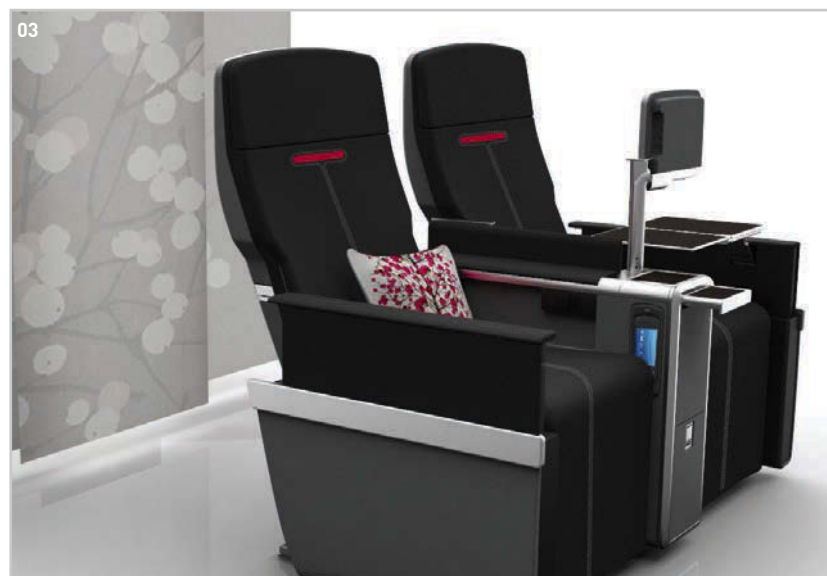
Our daily ritual is coffee, discovery, evaluation, discovery, evaluation, discovery... and execution.

INDUSTRY SITUATION On the path to the future, very few things escape the cycle of change and this includes the world of aircraft interiors. An interior style considered contemporary this year can morph quickly into a look that is considered passé next year.

The increase in the pace of product development means the design cycle



VERY FEW THINGS ESCAPE THE CYCLE OF CHANGE, AND THIS INCLUDES THE WORLD OF AIRCRAFT INTERIORS



we get the emergence of the rectilinear (modern) geometric style, as employed in the 2008 Swissair first-class suite. In the other mode, we see curvilinear lines as typified by the recent Qatar B787 business-class seat.

The continuous cycle of change and flow between these looks creates a demand within airlines to work across several fields – from big-name design agencies, through internal OEM teams, to the several vendors that supply the interior products.

PROBLEMS As the changes ripple through the aircraft interiors industry, there is also a parallel situation in the ebb and flow of influence that any specific agency might exert within the industry. The influence of any designer acting as a change agent has to be assessed against the longevity of the design the total aircraft interior

possesses. Contemporary designs typically have limited shelf life. An example of this is some of the linear, angular designs installed in North America less than one cycle ago.

Another issue is where designers create beautiful, but technically unbuildable, designs, garnering support and high expectations at the most senior levels.

Sometimes the subsequent inability to translate their compelling visual statement into a certified aircraft product creates delays, frustration and enormous cost overruns. There are situations where the effort can become sufficiently risk laden for the whole project cost to become a financial loss. In such a situation, the additional chagrin of having to use rewarmed existing designs further compounds the issue.

03. The MiQ business seat concept

can push a top-shelf design onto the lower forgotten shelves in a matter of months.

Compared with consumer goods, aircraft interiors are unusually resilient to such visual change. The design of an interior lining can take more than 15 years to evolve per aircraft type. In their design lifecycles, however, we witness typical smaller cycles of three-, six- and nine-year seating and monument refreshes.

On this sea of change, there are two design trends that appear with surprisingly regularity. In one direction,



Another problem scenario is when the marketing and design team has developed an outstanding and well-resolved proposal for a specific new aircraft type. They have spent months working with their branding agency and the aircraft manufacturer's interior design team. With the success of the design concept presentation, airlines discover that a design that works well in one aircraft does not necessarily work well in another.

TYPICAL CONCEPT DEVELOPMENT

The airline then faces the unenviable task of 'going it alone' in translating the existing design language to an aircraft that may be designed in a completely different interior style or colour palette.

This is an example where the different design styles come into play. A curvilinear interior concept cannot easily be shoehorned into a legacy geometric interior design. The design vision then becomes diluted by the aesthetic compromise. The concept becomes another victim of the design cycle change.

SOLUTIONS The B/E Aerospace Advanced Design Group (BEAD) team has the flexibility and capability to work with each airline, understanding the conceptual requirements, collaborating with their chosen design agencies, working alongside the OEM project team and, most importantly, developing these ideas into certifiable engineered products.



THE END RESULT WILL NOT JUST APPEAL AT FIRST GLANCE, BUT ADVANCE THE PASSENGER EXPERIENCE



The BEAD design team's rigorous approach has honed by working alongside one of the industry's strongest engineering organisations, mitigating the 'void' development situations as they arise.

When companies approach BEAD to redesign their aircraft seats and furniture, there are larger underlining branding, culture and influences to uncover. The exterior aesthetics are just the tip of the iceberg. Homing in on the hidden drivers unlocks a more meaningful solution.

BEAD also provides a development 'sand box' for all these design scenarios to be tried out. The team create virtual interiors, physical mock-ups and prototypes. For example, two distinct styles developed from different programmes can be tailored to suit each aircraft type and passenger configuration with an aesthetic touch and in such a manner that they will

gain certification. This can all happen well before the product definition has been set in stone by the engineering and certification process.

BEAD REMOVES THE VOID Without such room to explore, the design process can narrow too quickly. The team's best work comes from using its special skill-set and experience, in finding clever solutions and surprising discoveries that delight airline customers. The end result will not just appeal at first glance, but advance the passenger experience throughout the journey and reward the airline's brand. It is no coincidence that BEAD has had a major hand in creating four out of the top 10 Skytrax products.

Seating and interior product development doesn't happen by magic and it's not an unattainable future. The BEAD team invites you to join it on its quest. ☒

- 04. Phoenix, BEAD's latest economy design, has been shortlisted for an International Yacht and Aviation Award
- 05. Armrest detail of Phoenix

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Passion + Power

B/E AEROSPACE ADVANCED DESIGN GROUP



Passion drives us to be a world leader in cabin interior products. Power propels us to keep delivering a new best.




Passion to Innovate.
Power to Deliver.



2020vision

Passenger profiles may change in the future. An understanding of these changes is critical for creating successful cabin designs for the 2020 flying experience

 Mormedi is an international strategic design consultancy, well versed in product and service strategy. What sets Mormedi apart is its diverse activity across different industry sectors and geographies, having designed customer experiences (products, services and digital experiences) for airlines, public transport operators, banks, telecomms providers, consumer electronic manufacturers, medical companies, home appliance manufacturers and others (clients include Airbus, Audi, Alstom, BBVA, BMW, Caf, Coca-Cola, Duffry, EADS Sogerma, Hino, Hitachi, Hyundai, Iberia, Indra, LG, MTR, Nissan, Philips, RATP, Renfe, Siemens, Talgo, Telefónica and Vodafone).

“We have touched the lives of people in small and big ways,” says Jaime Moreno, CEO of Mormedi. While this versatility keeps challenging the team, it also feeds a big picture viewpoint and a lot of cross fertilisation – this is especially relevant in a time when most industries see themselves under pressure to question their current paradigms and transform themselves in order to stay competitive.

“As we all know, this process is not always easy, sometimes even traumatic



- 01. CMF proposal for Iberia's A330 business interior
- 02. The final version of Iberia's A330 business interior



– but this kind of ‘innovate or die’ situation also represents a huge opportunity as it opens up the space for change and ultimately for successful innovation,” states Moreno.

At Mormedi, the final objective is to create a delightful experience for the user while improving business for clients. Mormedi covers the spectrum of design services, starting with strategy, through conceptualisation and implementation – strategists, business specialists, designers and engineers make up a dynamic team that is complemented by additional expertise as required, depending on the context of each specific project.

Mormedi has a strong connection with aviation context, recent highlights

including involvement in the design of suites for the super first class of the Airbus A380 and the redesign of Iberia's long-haul cabins launched at the beginning of this year, as well as working on new seating concepts for the business and economy environments.

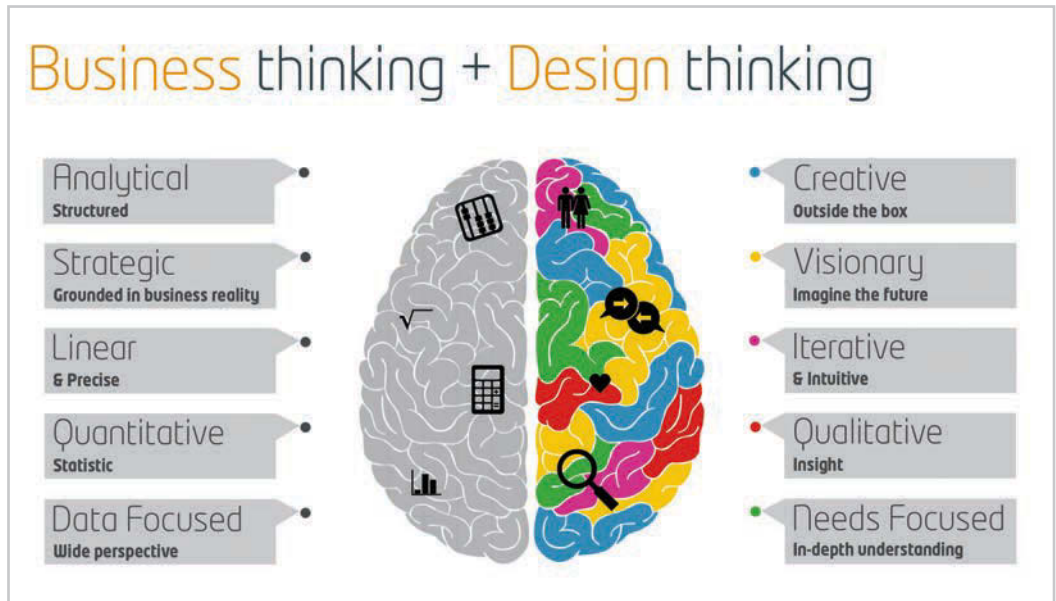
The Mormedi team comprises aviation specialists who have been working within the industry for more than a decade as aerospace engineers or as designers and strategists for groundbreaking products such as the B787 Dreamliner.

MARKET VISION Air travel has reached a historically high level, and is projected to grow. However, the world



“ AIRLINES HAVE BEEN TRYING TO DIFFERENTIATE THE ONBOARD TRAVEL EXPERIENCE ON ALL POSSIBLE LEVELS ”

03



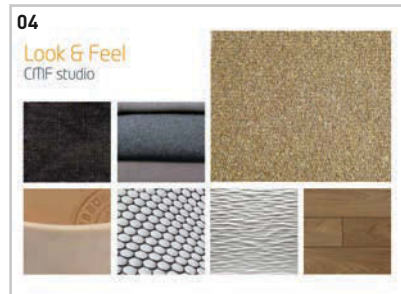
has also witnessed the worst economic crash in more than 75 years. It is fair to ask if this can still be called a 'crisis' or if it is a symptom of a more profound change. According to a recent McKinsey Quarterly Newsletter "...leadership in the 21st century has been a walk on the wild side".

The increase of complexity and uncertainty forces everyone to innovate and take risks. Airlines have been suffering from declining revenues, while fuel prices are rising and will continue to do so. Airline customers have become more empowered and value-conscious. So how have airlines reacted to these pressures?

Airlines have been trying to differentiate the onboard travel

experience on all possible levels by improving function as well as convenience, and by creating memorable moments – be it through mood lighting and the provisioning of destination areas such as bars and other social areas, chef-designed menus, or through using technology as an enabler for a more seamless and enjoyable experience (for example, luggage tracking or onboard social networking platforms).

In a highly contested global market, using differentiation to create a stronger brand and an emotional connection with customers remains key. Even Boeing and Airbus have moved away from their traditionally generic interiors towards emphasising a



03. Combining two modes of thinking: design and business
 04. The CMF proposal for Iberia's A330 business cabin

Here are some key thought starters when pondering a design for the 2020 flying experience:

- Start out by scanning your product for the unwritten rules or orthodoxies, always with an eye to questioning their relevance in today's context
- Pay tribute to the cultural and generational diversity of your flying customers
- Design at product, service and experience level
- Deliver a memorable and consistent experience on board as well as pre- and post-flight through all the touchpoints
- Empower your brand on all levels of the experience
- Connect with the passenger through delightful detailing
- Develop solutions that work for people, business and the world
- Focus on what the passenger really cares about

signature look with their respective designs for the B787 and A350.

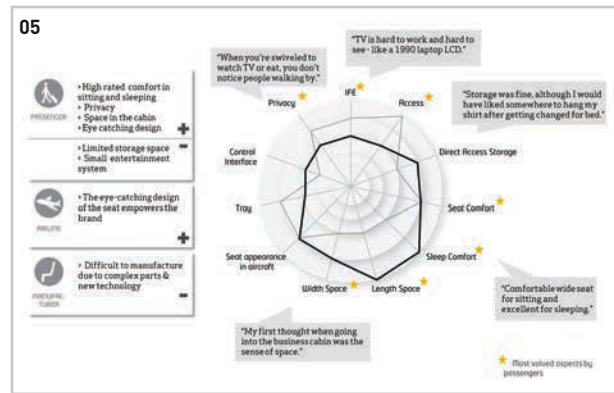
More recently, the trend to surprise and delight the customer is being taken to new heights. However, while airlines go to extremes in order to differentiate themselves from competitors, the conflict between their need for customisation and the OEMs' need for standardisation remains a challenge.

So a lot has and is happening in the airline industry, but an interesting question is what we see as the key to the future. As always, understanding is a great source of inspiration, and a key factor to understand is the people who will fly in 2020.

For example, today's notion of business class is a result of a historical context that we are about to outgrow. Take a typical European flag carrier such as Lufthansa, Air France, Iberia or British Airways. Looking at their customer base: although in the past most of their business travel clients would have been of European and US origin, in the not so distant future this might change – the numbers of current customers will decrease while the amount of Asian-Pacific, Middle Eastern and South American customers will increase.



THE TREND TO SURPRISE AND DELIGHT THE CUSTOMER IS BEING TAKEN TO NEW HEIGHTS



Although the paradigm of current international business travellers and their perception of value will persist, it might shift towards a slightly more pragmatic notion of premium – with less emphasis on exclusivity, and more of a focus on pragmatic added-value experience pieces that make the journey more enjoyable and efficient.

Mormedi believes it is imperative to gain understanding about the diversity and richness of cultures that will increasingly be travelling on tomorrow's airlines – about their cultural codes and basic rules, taboos and needs. We truly believe that this will be one of the key factors to the success of global airlines.

New generations are coming of age – generations with different notions about how to live their lives: interconnected, participatory and conscious about the self and the planet. The current corporate culture simply does not make sense to this younger generation, who might aspire to be a craftsman, banker or engineer, all at the same time. In fact there no longer

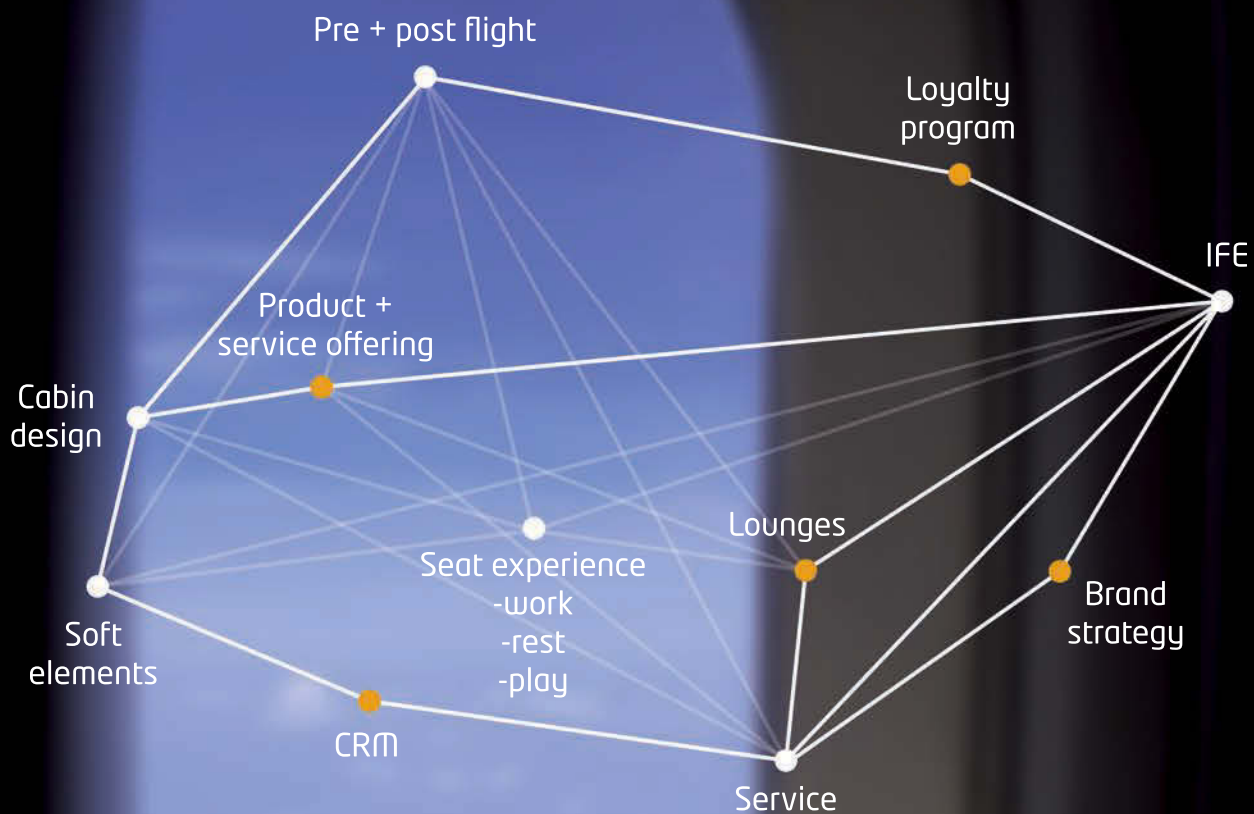
- 05. Competitive analysis – examining key experience factors
- 06. Mormedi innovation tools: helping clients to push boundaries

exists a definition of what a successful businessperson is. For this generation, exclusivity might mean something different – maybe it is more about working, playing and resting in seamless and playful ways while inhabiting a temporary space that enables pragmatic, flexible and sharable experiences? So what does this mean? Some points to consider when pondering a design for the 2020 flying experience can be found in Table 1.

THE WAY AHEAD We live in a time of extreme change, and this might seem daunting. It surely is not an easy task for airlines to decide what to do, when the rules of yesterday suddenly do not apply. However, Mormedi strongly believes that the only way ahead is to innovate and empower your brand at all levels of the experience, focusing on what the passenger really cares about, via targeted investments into the key added-value touchpoints. ☒

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A good cabin
is not enough
to be the best



At the end what counts is the
whole passenger experience

mormedi

innovating through customer experience

dreamsequence

Imagine an air travel process that made passengers feel in control and relaxed, through better information and smoother processes... Enter Concept FlightPass

Flashback to the Eero Saarinen-designed Dulles Airport, circa 1964 – men in crisp suits and ties, and women in Oleg Cassini dresses; a time when air travel was glamorous and exciting. The airport experience was an extension of the aircraft experience – a pleasurable one. Service was impeccable, seats were spacious, and security was something taken for granted.

Fast-forward to 1978 as the airline industry entered an era of deregulation and competition, discount airlines emerged and more travellers than ever had access to airline transportation. The socio-economic make-up of passengers shifted from primarily affluent travellers to more middle class passengers. Since 2008, fees have been implemented across most airlines and seat pitch has been reduced to increase revenue. These factors, coupled with additional security processes and crowding, have created an even less desirable situation.

The mystique of air travel has been lost over years of change and adaptation, and unfortunately the passenger experience has suffered. The American Customer Satisfaction Index, an independent benchmarking business developed at the University of



- 01. An open design with clear information empowers passengers
- 02. Concept Flightpass is intended to improve passengers' flow through the airport, and their experience

Michigan, concluded that the industry improved 3% in 2013 to a rating of 69 on a 100-point scale. According to the report, airline passengers were most displeased with crowded seating, extra passenger fees, and poor customer service. The airline industry ranks below the US Post Office and just above the subscription TV and internet service companies.

An airline's first opportunity to make an impression and to promote and improve its brand stature comes the minute a passenger walks through the airport door. Any airline traveller can relate to the apprehension felt when entering the airport only to encounter long queues, inconsistent signage, overburdened airline staff and TSA workers. The airport experience – like the airline experience – is long

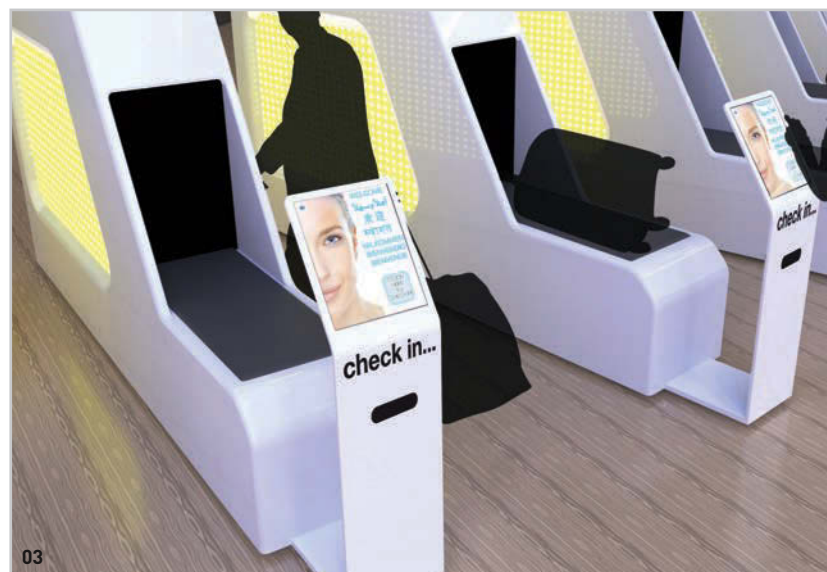
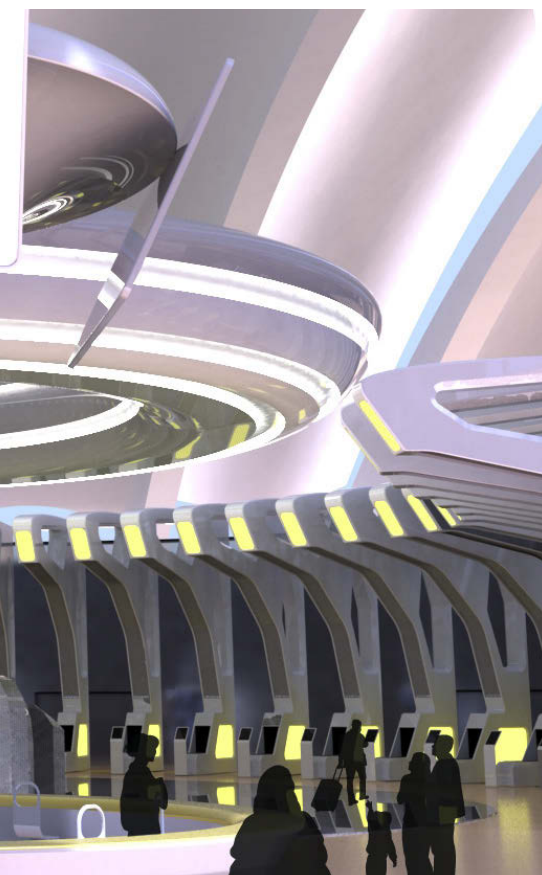
overdue for re-design and that is the reason TXS Industrial Design was compelled to address the problem.

"There are almost limitless experiential issues with today's airports and we didn't intend to solve all of the problems; we merely scratched the surface. Our goal was to start a conversation with the airline industry and to illustrate some of the possibilities using our creative thinking and design skills," explains Staci Miner, vice president of TXS Industrial Design. Through the use of strategic planning and technology, the passenger experience can be improved in a way that allows passengers to flow through the airport and interact with technology during check-in, security and boarding. The result of TXS's design exercise is Concept FlightPass –





CONCEPT FLIGHTPASS PLACES MORE CONTROL
IN THE HANDS OF THE PASSENGER



a flow system that encourages and guides passengers in a logical, efficient process through the airport to improve the overall experience.

PASSENGERS TAKE CONTROL

Modern travellers have little control of their destiny during check-in and security screening, and this can cause anxiety. TXS's Concept FlightPass places more control in the hands of the passenger by incorporating an interactive ticket that guides the traveller through the procedure. When they arrive, the kiosk prompts the user for biometric data, fingerprint and facial recognition, credit card information (through near-field communication), and entertainment and food preferences. Once all the information has been gathered, the

Concept FlightPass is issued and there is no need to show an ID. The low-cost e-ink ticket receives updates with important information such as gate changes, boarding calls and seat assignment. It is also used through the security clearance process and is docked to the passenger's aircraft seat for a personalised flight experience.

INTEGRATED CHECK-IN Most airline passengers are familiar with self-service kiosk check-in, but what if the kiosk and baggage drop were in one location, eliminating the need to walk to yet another line? What if there were 50 kiosks instead of just a few? Much of passengers' frustration is felt due to concerns about long lines and missing a flight. Check-in kiosks should clearly communicate to a passenger the steps of the process, informing them when a lane is open, when they may proceed, and when their baggage is accepted. Standardised, airline-agnostic check-in kiosks implemented in multiple airports would create a familiar experience from location to location and airline to airline, and convey the exact same type of information. This consistent message would reduce

feelings of apprehension for travellers and enhance the overall experience. Passengers of the future will also arrive with their own baggage tag, which will be capable of being recognised, routed and tracked.

SEAMLESS SECURITY Today's airport security is a collection of reactive systems and processes based on past security events. These systems are layered upon each other with no attention paid to integration. In the past, security was nearly non-existent and passengers and visitors were allowed to pass through checkpoints freely. To have the freedom and flexibility of the past, paired with modern security technology, would greatly improve the airport experience and TXS proposes that, with a concerted design approach, this concept could be attainable.

Concept FlightPass uses the design principle of progressive disclosure to encourage travellers to move forward in a relaxed way. Only revealing necessary information would control the flow of travellers. Five kiosk/bag-drops feed directly into one security check to prevent congestion. Travellers

03. Clear and consistent: standardised check-in kiosks further simplify the journey



next pass through a buffer zone and are allowed passage to the security check. An inviting glass door with interactive instructions greets the travellers and guides them through the process with simple instructions. The Concept FlightPass recognises the traveller and approves them for entry, reconciling the person entering security through facial recognition. A unique floor-level scanner/conveyor scans baggage and is met by the passenger on the other side.

With today's security systems, privacy is a concern for some passengers and being frisked in view of strangers is not preferred. Privacy is improved with Concept FlightPass because travellers do not need to disrobe while others are watching. Technology enhancements used to identify potential threats along with proper interior space design would determine and separate the cleared passengers from the potential issues. If there is a security concern, a TSA agent will be notified and a more thorough security check will be performed in a comfortable private area.

EFFICIENT BOARDING Boarding is another airport process in need of improvement. With Concept FlightPass, passengers are organised in an efficient manner to ease congestion. When a boarding group is called, the passenger is informed through Concept FlightPass that they have approval to board. As they approach the gate, the traveller must swipe the pass to gain access and if the group is not currently boarding, the traveller is denied access. Again, there is facial recognition technology in place at the gate to verify that the Concept Flightpass matches the passenger boarding the aircraft for a second layer of security.



THE AIM OF THE CONCEPT IS TO SPARK CONVERSATION BETWEEN AIR INDUSTRY DECISION MAKERS



On board, while walking down the aisle, Concept FlightPass directs the passenger to their seat location. When seated the passenger docks it in the seatback and the display immediately recognises and greets the passenger with a personalised interface, enhancing the experience. The entertainment preferences entered at the kiosk are now available for viewing.

IMPLEMENTATION Addressing an airport design problem of this magnitude would require significant coordination of the airlines, airports, DoT, and multiple municipalities. It appears to be a daunting venture, but if airlines understand that an enjoyable airport experience does and will affect the bottom line, and agree to explore ways to improve the overall experience, there may be hope for an improved airport process. The rewards and benefits may not be realised for years, but if there is vision of the possibilities

- 04. An interactive ticket guides the passenger through the travel procedure
- 05. The FlightPass guides passengers to their exact seat

and a clear goal, the stakeholders could collaborate to work towards a common, modernised future. Realistically, change will be implemented incrementally and would work as long as it follows a strategic blueprint.

The aim of Concept FlightPass is to spark conversation between air industry decision makers. There are hurdles to overcome but if there is an initiative for the future, the industry would have a strategy to pursue and would eventually adapt. A view of the future is important, in order to encourage progress.

“Industrial designers have the unique capability to visualise human processes in a comprehensible, distinct, experiential way. An integrated design approach, developed by a concerted group of stakeholders, could radically change the future travel experience, making it more enjoyable, cost effective and efficient without compromise to safety,” Minger concludes. ☒


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ENHANCE YOUR EXPERIENCE



feelgoodfactor

When Air Tahiti Nui embarked on renewing its cabin interiors, it enlisted the help of Designscence, which uses sensory design to inspire its creations

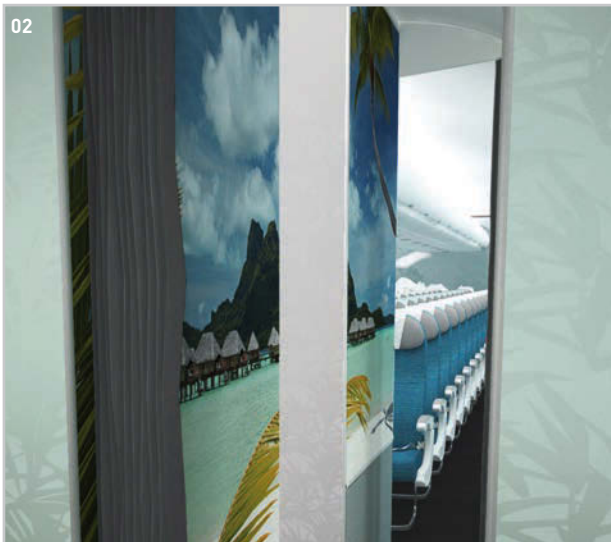
 Designscence approaches airline cabin design by focusing on the sensory aspects of all materials, colours, lighting and accessories. The team uses sensory design as a foundation for its work, which includes trim and colour, cabin amenities, serviceware, mood lighting, and industrial design.

“Sensory design goes one large step beyond the core values of design (form and function) by taking a holistic approach,” says Frederique Houssard, founder and artistic director of Designscence. She continues, “It puts the human experience at the centre and enables us to add a new dimension to the aircraft interior design equation: the sensory. Applying it to an aircraft cabin, our designers consider the passenger experience in the space, taking into account the five senses.”

Sensory-based design first emerged in the early 1990s in the food industry. Product development specialists started to experiment with influencing consumption behaviour based on appealing to different senses. At about the same time, it also took root in the automotive industry. A sensory approach was used by car manufacturers to decide on different



- 01. The green palm motif cushions in business contrast with the blue seats, which reflect the clear waters of Tahiti
- 02. A trompe l'oeil image of Tahiti at the entranceway transports your mind there ahead of the flight



features inside a car such as leather for steering wheels, and more tactile seat fabrics. Further studies were carried out into the ‘best’ sound for a car door closing and creating engine sounds that are most pleasing to the human ear.

Sensory design uses a variety of tools and methods to qualify and quantify sensations (using ‘sensory descriptors’), to help choose and organise materials. For example, when working with a supplier, one might say they want an armrest material that is fibrous (at 12%), thermal (55%), and braking (12%). These tools enable those working on a project (designers, engineers, manufacturers) to speak the same sensory language.

Houssard, a colour and trim specialist, believes the application of sensory design is lagging behind in the aviation industry. She clarifies, “Although used successfully for years within the food and automotive industries, sensory design deserves further exploration and application within the aeronautics field because it has so many positive possibilities for optimising the passenger experience and cabin environment.”

Certain sensory considerations are typically involved when designing a cabin space. For example, in a confined space, a person tends to feel external stimuli more intensely. Surfaces that are rough to the touch, prickly, itchy, hot,



SENSORY DESIGN DESERVES FURTHER EXPLORATION AND APPLICATION WITHIN THE AERONAUTICS FIELD



or sticky can make us feel uncomfortable and make an already dense space feel hostile and aggressive. Colour choices must be carefully evaluated, as the cabin is a narrow space. The same applies to mood lighting. Shades of light that are too warm or saturated can psychologically decrease our space and give us the impression of suffocation. This perception becomes amplified if cabin temperature increases and can also make the flight feel even longer.

Sensory design is a tool that can also be used to counter the constraints associated with travelling on an aircraft. While the aircraft is a widely used means of transport, it is still viewed

with anxiety. This is where the treatment of surroundings can be very effective for the purpose of alleviating and reassuring the senses. This is also an excellent way to improve the surroundings for economy passengers, often forgotten in the quest to add luxury to business and first class. For example, using materials that are natural or rich to the touch (leathers, wood) on surfaces close to the passenger's seat can provide reassurance. A high degree of quality in the immediate surroundings gives us a subconscious sense of security, of safety, whereas too much plastic can translate into a cheap feel, and therefore, an unsafe feeling. This

03



perceived level of quality also has another important dimension – the association with the airline brand.

Houssard, who worked for the Airbus cabin design office for nearly 10 years and conducted extensive research into the application of sensory design to the aircraft cabin as part of her doctoral work, explains, “When working on a project with a client, as part of a sensory design approach, we do an initial organisation and categorisation of materials. This allows for a better overview of materials available on the market. Also, the elements that will make up the cabin design must be worked together to identify the best sensory associations

03. A sensory design methodology is used to create cabin projects



and material combinations to achieve an optimal final result. With these choices we create an 'equation' of the materials making up each cabin design. Applying sensory design, therefore, goes beyond just decorating the cabin."

INTERIOR DESIGN Designscence was asked to revitalise the interiors for Papeete-based Air Tahiti Nui with a contemporary design that would bring forth the charm of Polynesia.

Many aspects of the cabin design and the Air Tahiti Nui travel experience reflect a sensory design influence. One's senses are transported to Tahiti by a trompe l'oeil image found at the aircraft entrance. Stepping onto a hardwood-effect floor upon entering the cabin and looking up, gives the impression of standing on a Tahitian bungalow sundeck overlooking a clear-blue lagoon. The use of wood-grain flooring, as opposed to something looking very synthetic, is comforting because it gives the sensation of walking on a familiar material one might find at home.

Colours and materials evoke the first sensations experienced when one arrives in Tahiti: the warmth of its woods, the intensity of its blues, the luminosity of the islands, and the freshness of its vegetation.

A Tiare flower, the symbol of the airline, is given to each passenger as they are welcomed aboard, infusing the cabin with the fragrance of Tahiti (as well as the sound of Tahiti, with ukulele music playing during boarding). Also, a depiction of the flower is found on the headrests, as if floating on water (a reference to the external livery). Presented off-centre and in different sizes, it helps to break

“

APPLYING SENSORY DESIGN GOES BEYOND
JUST DECORATING THE CABIN ”



04. Designscence worked hard to evoke the colours and feel of Tahiti in the cabins
05. The Air Tahiti Nui economy cabins include bright cushions that evoke thoughts of exotic flowers

the repetition imposed by the visual alignment of the seats, which lightens the whole effect.

Inviting touchpoints are provided by amenity kits, made of recyclable materials reminiscent of certain Polynesian plant textures and the Polynesian art of weaving.

Colourful cushions in economy class appear like exotic flowers scattered in the landscape, while in business class, the cushions printed with green palm motifs provide freshness to the space. Touches of green in the general colour harmony reflect the green found in the island's vegetation. These bright colour accents provide contrast, which highlights the depth of the blue seats.

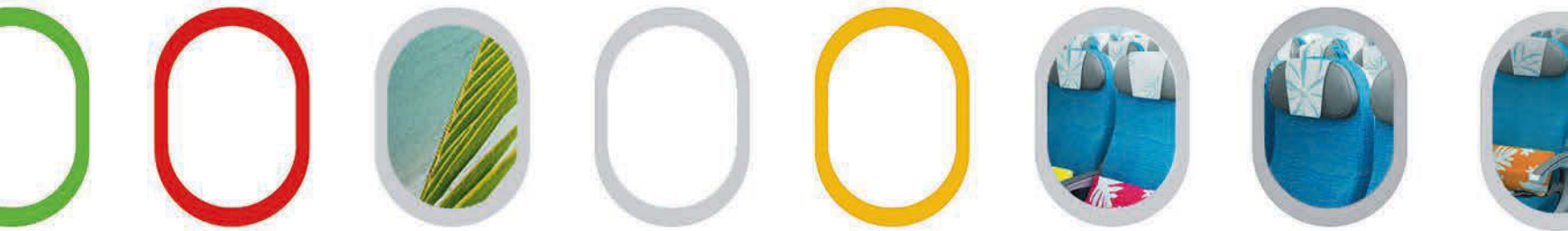
Houssard says, "It was a pleasure to work with the Air Tahiti Nui team on the new cabins. It was a collaborative process that brought lots of good ideas to the table, and the result is a cabin that truly reflects Tahiti's beauty."

Talking about the sensory design in the aircraft, Houssard states, "The aircraft is a mode of transportation different from the car, bus or train, in that it is a highly sophisticated, cold piece of machinery that needs to be transformed, for the passenger's sake, into a more welcoming environment. It is through applying a sensory touch that we can achieve this feeling and simultaneously increase passenger loyalty as a result of passenger satisfaction." ☒

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Designescence

Airline Cabin Design



UPGRADING THE PASSENGER THROUGH **SENSORY** DESIGN



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From luxury car finishes, to the feel of the streets of Singapore, to fashion collaborations: a new studio is bringing fresh ideas to the industry



The aviation industry is defined by challenges and constant evolution. Working with an airline is about overcoming the challenges of the physical space and an industry that is subject to the realities of programmes, timelines, budgets and scope, to deliver a premium and beautiful product.

A project like the flagship Qantas A380, for example, was a dream in the sense that the Marc Newson and Qantas teams were allowed a golden opportunity to start the design from a clean slate. Programmes are usually faster and built around different structures, and therefore present their own set of challenges due to the limitations on the influence a creative agency can have over the finished package. Working within such limitations can, however, result in very successful outcomes, as well as being hugely rewarding. A narrower scope can actually serve to focus a design team on the elements they can influence and lead to a more carefully considered outcome.

- 01. The CS04 staggered business-class seat
- 02. Caon's SIN (Strength In Numbers) chair design

01



02



BLACK ON BLACK The soon-to-be-released QantasLink B717 cabin presented some such challenges. Given the refined scope of a programme where restrictions were placed on the design in terms of what aspects of the seats and cabin were customisable, Caon Studio was able to focus its efforts on developing individual components to improve the customer experience. Working closely with the Qantas team and a relatively new seat supplier on an existing product platform, Caon Studio crafted seat components still under development to give space back to the passenger and redefine the overall aesthetic.

“Immediately we thought there would be an improvement by creating an asymmetric seatback to give a broader seat,” recalls creative director,

David Caon. “We also sought to influence as many parts that didn’t require tooling as possible to tailor the seat to our client and align it more closely to a premium brand like Qantas.”

The studio also set to work developing a range of bespoke materials and finishes that worked in conjunction with off-the-shelf components to create a genuinely new direction for the QantasLink brand.

“We had been playing with a ‘black on black’ colour scheme for a couple of years and, along with our client team, we thought this would be the perfect application,” says Caon. “The B717s are small aircraft doing short, fast trips, so we sought influence from luxury GT sports cars for our trim and finish. There’s a great symbiosis between the



AIRLINE BRANDS ARE NOT JUST IN THE BUSINESS OF SUPPLYING TRAVEL



- 03. The QantasLink B717 interior
- 04. Caon's vision of the bottle for Crown Lager, Australia's premium beer
- 05. Packaging for Oscar.697 vermouth

the design direction, with a key focus on regional influence, cuisine and luxury.

“Our launch point became the city itself. The Qantas team was determined to reinvent the lounge environment and make it into a vibrant and contemporary space, much like Singapore itself. So we sought to use Singapore as our main influence for the design and developed a concept that was collectively referred to internally as ‘Singapore Streets’. It mapped out different zones much like inner city regions and included Qantas and consulting chef Neil Perry’s stunning live kitchen concept and cocktail bar. The zones are separated by a ‘brick lane’ pathway. Greenery also features prominently as a vital well-being element.”

Such ideas form the core ideology of Caon Studio that airline brands are not just in the business of supplying travel. Top-tier brands are definitely in the experience business and this means environments, feelings, well-being, taste, perception and connections.

“To work effectively for an aviation client, a design studio must be multidisciplinary, whether it defines

itself as such or not, because we need to react to the hundreds of different elements that contribute towards the customer experience and which must be addressed to deliver a successful result and play a role in helping the brand forward,” says Caon. “A broad perception of things and an ability to innovate and adapt is key to clients in a market that is in a constant state of flux.”

KEEP IT REAL This constant evolution, with airlines regularly testing different layouts to maximise passenger space and yields, means that Caon Studio will experiment with design variations on proven layouts to test the adaptability of an aesthetic.

“I like to see what we can do within real-world situations. I think it’s great to play around with innovative ideas for cabin interiors, but a studio also has to be able to make something cool today, which is the thinking behind the CS04 business-class seat. We wanted to see if we could apply an aesthetic to a staggered business-class seat layout and arrive at a result. We placed a focus on materiality, stowage and refinement,” says Caon.

two environments. Both are small spaces built to travel at high speeds and still requiring a strong luxury element. While the colour palette is predominantly black, it focuses on layering different textures to create complexity and refinement.”

OUTSIDE INFLUENCE Taking inspiration from the automotive sector is certainly nothing new in aviation design, but Caon Studio does not stop there. Inspiration can come from anywhere and projects are usually initiated by presenting a broad vista of ideation to the client in the form of imagery and stories that speak to the brief. The Qantas Premium Lounge in Singapore was created this way. Qantas wanted to shift gears for this project and developed a very strong brief for

04



05





COLLABORATIONS While the aviation sector is specialised, ideas can come from many other industries. There is something to be gained by looking to other areas for ideas as well as partnerships. Cross branding and collaborations are prominent in music and fashion design and this is an area that has piqued the interest of Caon Studio.

“Brands are now increasingly experimenting with collaborations on limited editions of their products that are designed and sometimes produced by other labels or artists,” says Caon. “A good example is Converse. The trainer company recently announced a new collaboration, this time with French fashion house Maison Martin Margiela, to produce a version of its staple sneaker. Margiela could not be a more different brand from Converse, but the symbiosis between the two brands creates a tangible and desirable product. It works and it’s cool.”

Caon has this concept at the forefront of his mind and talks to his clients and suppliers on a regular basis about experimenting with such alignments. The average airline has so many elements that must work together to make up the brand and the experience. It seems an excellent opportunity to create alignments that diversify and strengthen a brand.

“We think about crazy stuff. I’d love to see an airline do a fashion branded interior. Working with designers is nothing new, but what if you threw a fashion label or established furniture brand into the relationship? It would open up so many new possibilities and could result in some excellent brand connections for passengers.”

Collaboration is core to the Caon Studio methodology. Preferring to



WE THINK ABOUT CRAZY STUFF. I'D LOVE TO SEE AN AIRLINE DO A FASHION BRANDED INTERIOR



remain small and focused, the office will routinely work in partnership with other experts to service projects properly. Caon Studio collaborated with airport lounge specialist Sumu Design to design the Singapore Lounge for Qantas and is currently working with Sydney-based retail design office Juicy Design to deliver a massive brand experience for a luxury client in Beijing.

“Collaborations for us mean that we can focus on the creative direction of projects and react quickly to new opportunities without having to turn the office upside down in order to be involved,” explains Caon. “Our relationships with clients, especially long-established relationships, are

06. The studio has designed everything from hospital suites...

07. ...to Qantas' striking Singapore Lounge

indeed collaborative in nature. We don't pretend to know more about their brands than they do. We see our role as bringing a diversity of experience and often foreign ideas into that relationship, and enriching the creative process as much as possible.”

Caon Studio began only a few years ago in Sydney, founded by creative director David Caon. In 2013, it has undertaken projects in product design, interiors, architecture, brand development and, of course, aviation. The studio has significant experience in the aviation sector, with Caon himself a senior member of the Marc Newson Ltd team, which led the brand development of Qantas, including the A380 cabin interior. ☒

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PUT AN END TO BEIGE.



caon.


Caon Studio. A multidisciplinary design bureau with 10 years experience in aviation. Seats, Cabin Interiors and internationally acclaimed Airport Lounges. We're just getting started.

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Small, dynamic and different. We'll work with you to find a fresh approach.

futuregalleys

A configuration tool has been created that enables airlines to design and visualise a galley using a modular process

 Imagine sitting around a meeting table with your team, creating your own dream galley. Then imagine customising a galley for your aircraft's specific operational requirements, adding your own configuration of components and accessories, choosing the colours, and then instantly being provided with a realistic 3D visual of your galley – all of this achieved over the course of a few simple steps via your laptop or iPad.

Given the complex nature of aircraft galleys and all the factors involved in their design, it does seem a rather unlikely scenario. However, thanks to the clever design team at Altitude Aerospace Interiors, the dream is now a reality. Altitude has always been at the head of the pack with aircraft interior designs, collecting awards and industry recognition for its efforts over the years. After evaluating the current galley market, this New Zealand-based company felt it could not only create a more stylish galley offering for airlines, but one that is more flexible and user-friendly than anything else currently on the market – a pretty ambitious goal, but one that Altitude has made a reality. An extensive research and development programme was implemented and now airline operators



are able to take advantage of this hard work and state-of-the-art technology to work with Altitude in creating a galley that not only reflects their brand, but also enhances the experience of customers and crew.

GALLEY TOOL Altitude's Galley Configuration Tool is new to the market and will enable airlines to step through a modular design process and design their own galleys. They will be able to instantly see realistic 3D views of how their proposed galley will look, right down to the colours and trim. A customer can select a range of galley

inserts and compartment layouts to get an instant visual of the galley. Making smart design decisions will be easier than ever before with the help of this configuration tool.

In developing this tool, Altitude has taken a step into the airline's shoes to consider how to simplify the entire pre-purchase process. In the past, suppliers would present myriad engineering drawings to illustrate the proposed galley design. Several meetings, several re-draws and much anxiety later, the supplier and the airline finally achieve what they mutually agree is the best design solution. Not everyone is able to



GALLEY AREAS ARE INTEGRAL TO

THE ENTIRE INFLIGHT EXPERIENCE



clearly visualise the end result based on these drawings and this can limit the ability to provide immediate feedback on major factors, which ultimately slows down the entire process.

Galley design has remained relatively unchanged for decades, and Altitude is on a mission to change this. As travellers have become increasingly discerning, commercial airlines are looking for interior solutions that differentiate themselves from their competitors. This trend has been seen around the globe, with innovative seat design, monuments, IFE and service offerings, but galleys have retained the

same look and feel throughout the years. Altitude has had its sights set on the galley market for some time now, with a vision to help airlines bring galley designs in line with their brand and other interior components on an aircraft. Altitude is now able to deliver an easily configurable galley that offers the very best operating performance during the inflight service cycle – all of this without compromising on style.

Galley areas are highly visible to customers; they are also integral to the entire inflight experience. A galley malfunction or poor design can impede the cabin crew's performance, causing

dissatisfaction to customers. There are many departments within an airline that interact with a galley on a daily basis, and each has a different take on the key design elements important to the final galley design. Altitude spent substantial time interviewing staff from all areas of the airline business, understanding how each department currently interacts with the galley, and how this could be improved. The cleaners, caterers, security and crew all want something different from their galley experience, but all are ultimately looking for a smooth operational process. The airline marketing/

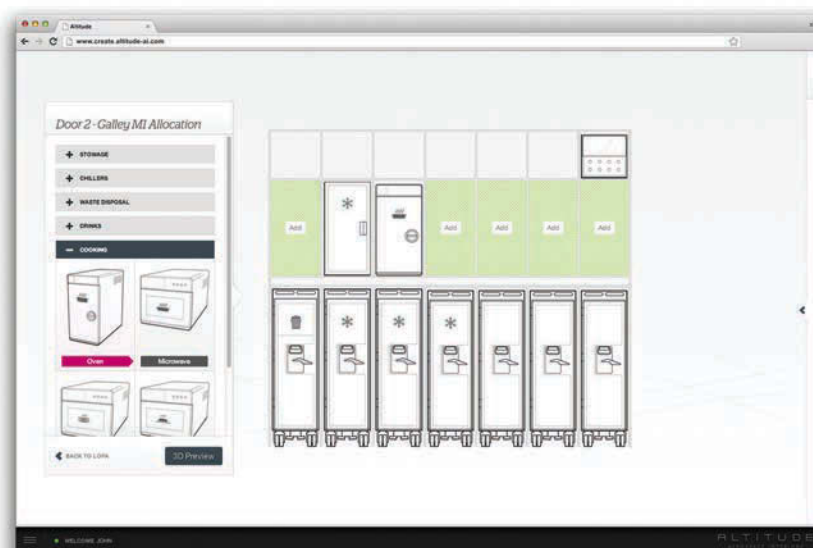
- 01. From fabulous to functional, a wide range of galley designs is possible
- 02. The software allows users to see how their galley will look, complete with colours and trim

branding teams want to achieve a visual and practical experience that is in line with their brand and will influence the way in which a customer will remember their flight. Airline programme management and procurement also each have a slightly different take on the final outcome of a new galley. The airline's customers may not even know what they want from a galley, other than just good service during flight. Each viewpoint has been taken into consideration while working through a galley development project and Altitude is now ready to get concepts in front of airline customers.

The company is hoping that the Galley Configuration Tool will change the market completely. The tool not only creates a 3D visual of the end result, but also has the ability to output technical specifications such as weight, along the way. The tool allows for variations in specifications relating to class type, galley footprint, cart, insert and compartment layout, and then allows users to view 3D visualisations of the configuration. It allows configurations to be saved and compared with subsequent versions so that an airline can share the design and its implications with their wider team, obtain feedback and make quicker decisions.

Baden Smith, Altitude's head of airline business, says, "This tool has revolutionised the consultation process with customers. It enables an airline to make its 'wish list' and together we can work through the implications of each decision until we can come up with a design that works. The tool provides very realistic visuals so that we can work through customer feedback and come up with alternative designs almost instantly".

The Galley Configuration Tool is intended to eliminate a lot of guesswork and improve confidence that an airline's operational requirements (cart space, rubbish space, chilled stowage, etc) are being satisfied. The tool also provides airlines with a clearer mechanism for communicating all elements of the galley design to the wider groups of internal stakeholders. "All of these factors help speed up the process and provide total transparency to all parties throughout," says Smith.



03. Users of the Galley Configuration Tool can input all their technical specifications before creating a 3D visual of their design

03

Customers using the Galley Configuration Tool may be impressed by its simplicity, but a great deal of sophisticated technology lies behind this tool. Superior 3D visualisation has been achieved using a number of high-tech production tools. The visual fidelity has been fine-tuned to match AAA standards, which is in line with top console and PC 3D games. Additional post-processing elements include SSAO (screen space ambient occlusion), HDR (high dynamic range lighting), along with tone-mapping, which helps create the most realistic image of the galley design.

Altitude is a Boeing BFE and a Boeing SFE company, plus an offerable

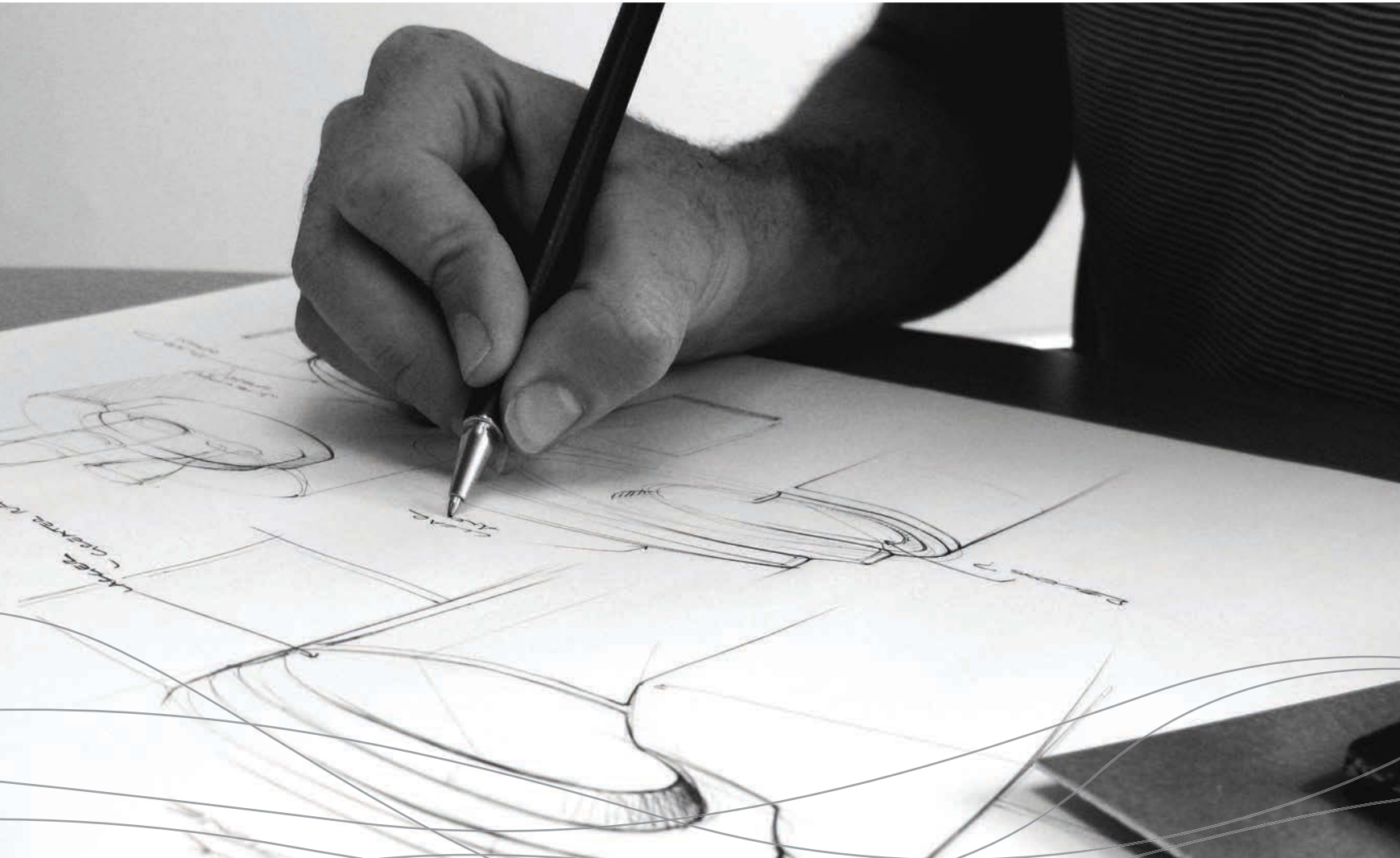
B777 and B767 galley supplier (one of only two currently offerable on B777s).

While these designs may have caught the attention of discerning clients around the globe, the company is not resting on its laurels. "Altitude Aerospace Interiors has grown substantially over the past five years," says general manager Michael Pervan. "Alongside the huge opportunities opening up for us in the commercial airline sector, our VIP completions business is in full growth mode. Our second green completion is due to arrive at the end of 2013, and it's fair to say that the entire Altitude team is pretty excited by the projects and challenges that lie ahead." ☒

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ALTITUDE


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fresh approach

Attention to detail and a harmonious working environment can create great results, as the new Condor interiors show

 Northern German design house müller/romca has become well known thanks to its standard lavatory developments for all Airbus long-haul aircraft. This track record led to Lufthansa awarding a contract for the development of first-class lavatories for the A380, A330, A340 and B747-8, which are all now flying with luxurious lavs featuring an architectural flair unprecedented in aircraft. This was followed by further contract awards from Lufthansa, including one for the development of a unique combined seat/bed for first class on board the B747, and the premium economy class, which is eagerly awaited.

This has not gone unnoticed by other airlines; consequently, the designers have been working with Condor since 2012 on the refurbishment of its B767 long-haul fleet, which will be commencing in the near future.

Until recently the Germans were the world's most frequent travellers (only recently overtaken by the Chinese and Americans). Long-distance holiday travel is particularly popular with müller/romca's compatriots, and people from neighbouring countries also make use of the services of charter flight

01. Condor's B767 fleet refurbishment includes seats, lavs, entrances and galleys



specialist Condor to get away from home for a few weeks. At the same time, more and more business travellers are also using the airline.

Condor decided that it wanted to have the interiors of its fleet of B767s completely refurbished, and müller/romca prevailed in a request for proposals thanks to compelling arguments and an attractive price.

Seats, lavatories, entrances, galleys and lighting have been redesigned and an integrated concept developed. Condor's membership in the Thomas Cook Group is also reflected in the inclusion of corporate design elements and colouring. At the same time,

Condor sought an independent and instantly recognisable look for its long-haul fleet.

The challenge was to develop, within the confines of these requirements, a fresh, previously unseen, modern yet timeless design, which bridges the gap between the anticipation of an eagerly awaited holiday and a casual feel on the one hand, and seriousness and respectability on the other, combining all the needs and expectations of the passengers and the airline.

"To be quite honest, the most daunting challenge was to achieve all of this in the short time that was available



THE RESULT IS ALWAYS WORTH THE EFFORT

FOR US AND ALSO FOR OUR CUSTOMERS



02. The Majesty seats in business class are trimmed in a darker shade of blue than economy

matching the colours of leathers, materials and plastics, defining the specification for the production of the materials, and making numerous visits to the various suppliers.

“We demand quality from ourselves when it comes to design, and also from the suppliers. Although we can occasionally be pretty fussy, we have so far always found a solution that is satisfactory to all parties involved,” says Jochen Müller, the second partner at müller/romca, who was responsible for customer and supplier relationship management during the execution of the project.

It is this blend of innovative design freedom and an uncompromising approach to creation and quality-driven pragmatic problem-solving that müller/romca says is the hallmark of its work. Jens Romca's colleagues consider him to be the final internal arbiter of good taste within the company. His high expectations of new designs repeatedly pose challenges for his staff, but ultimately they always pay off, according to Romca. “These design phases can occasionally end up consuming a lot of time, but the result is always worth the effort for us and particularly also for our customers,” he explains.

to us between the award of the contract and the presentation of the concept,” admits Jens Romca, one of the two müller/romca partners.

Numerous design elements with a different weighting of colour, brightness, texture and impact, as well as different degrees of incorporation of the group corporate image, were created during this phase. At the same time, it was necessary to develop concepts for distinguishing the individual classes, as well as approaches for the uniform use of overarching design elements. Only a few weeks were available for this phase, at the conclusion of which work

commenced almost immediately on implementing the plans with the individual suppliers. Refurbishment of the entire Condor long-haul fleet is to be completed by summer 2014.

“Condor then swiftly accepted one of our own favourites,” Romca says wryly. Together with the staff at the müller/romca office in Hamburg, Jens Romca worked on the creative aspects of the development work.

Although the basic design work is performed during the concept phase, most of the time with such projects is then spent on developing the materials, selecting the main and supplementary colours, carefully

CONDOR SOARS As part of the refurbishment project, the previous Condor Comfort Class is to be renamed Business Class. The Majesty reclining seats sourced from Zodiac Seats France are equipped with large screens and a comfortable bed, which can be reclined to an angle of 170° and extended to a length of 1.80m, thus meeting business travellers' expectations.

In addition to different seats and seat pitch, the classes are distinguished by coloured materials in different shades of blue, the darkest shade reserved for business class and the lightest one used in economy, with



a richer contrast in the shade of grey used in the head area.

The seat cushions and kinematics of the business seats have been optimised to enhance ergonomics to ensure that passengers sit as comfortably as possible and feel relaxed. “We contributed design input to all aspects of the seat development, providing impetus, suggestions and assistance with the decisions to be made,” says Müller. The designers attach particular importance to ergonomics and ease of use and, as with all other projects, pay painstaking attention to the quality of the details. Thus, much to their frustration, suppliers may be asked to reduce gaps or to improve the surface quality of the plastic or metal parts.

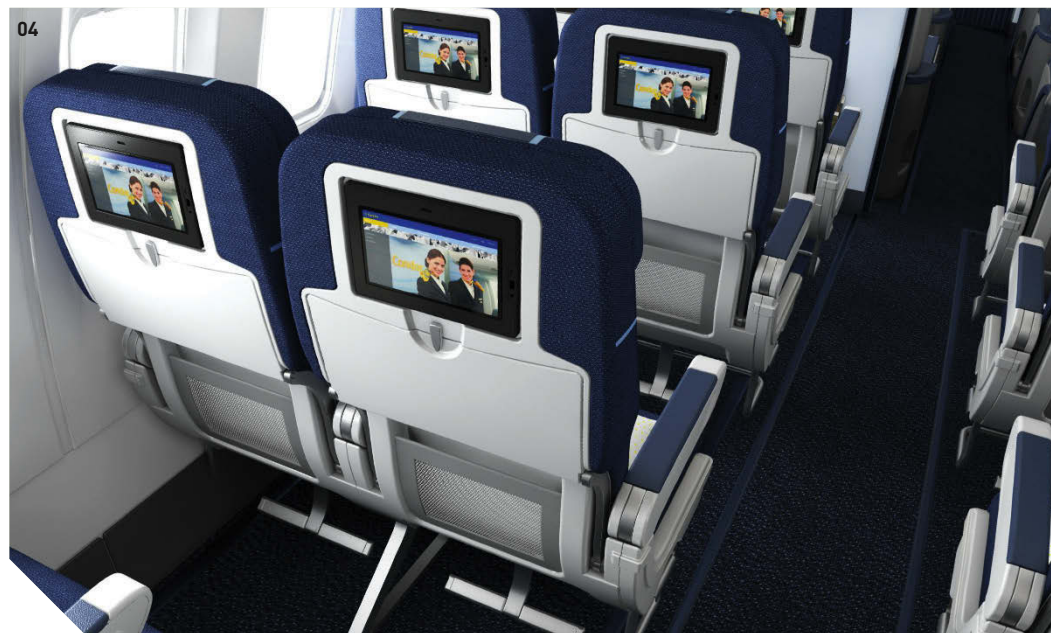
“We are working on establishing criteria for surface and workmanship quality, which have long been standard practice in other sectors and need to be extended to the aviation industry. All too often, the finish and look are more reminiscent of Apollo 11 than anything else,” says Müller, alluding to the 1960s-style atmosphere, which can still frequently be found on board aircraft. In the automotive industry, poor matching colours of plastic parts, different shades and brush directions in aluminium components, fluttering plastic parts with sharp edges and wrinkled seat covers straight out of the factory, as it were, would be met by competitors’ ridicule and scorn.

“Obviously, we face difficult conditions on board an aircraft given the limited selection of materials, low number of pieces and extreme strains in the air. Even so, there is plenty of room for improvement and we are only too willing to help,” says Müller.

ZIM Flugsitz in Germany and Zodiac Seats in France are two open-minded seating suppliers that were willing to implement the many changes and improvements in their own interests, thus improving their

“

WE ARE WORKING ON ESTABLISHING THE CRITERIA FOR SURFACE AND WORKMANSHIP QUALITY ”



03. A lot of work went into ensuring the materials and finishes matched those of the original concept
04. Zodiac’s RAVE IFE system was incorporated into the seatbacks

products as a whole and making them more attractive.

In addition to the seats, all the other surfaces visible to passengers were also revised. Decors for the dividers and monuments had to be developed, sampled and tested together with other materials under realistic lighting conditions. “We have a special room for this purpose in which we can expose materials to sunlight, as well as different LED and neon light sources in different light temperatures to examine the effect of the colour. Colour matches that look great in daylight may suddenly appear garish and inappropriate in LED light. We perform such tests at an early stage during all development projects,” explains Romca.

The result is a harmonious whole in which the plastic covering around the guidelines matches the colour of the seatbelts. “At first glance, this may appear to be a little exaggerated but the

details have a crucial effect on the overall look, the importance of which cannot be overestimated,” Müller and Romca concur. And the result is impressive, as a virtual guided tour of the new cabin shows (see www.condor.com/downloads).

The designers particularly appreciate the very good and close collaboration with the client and the suppliers. Although the results of the project always have top priority, a friendly atmosphere is frequently highly conducive to obtaining the best results. “Generally speaking, we are noting a positive change in the working environment,” says Müller, adding that “hierarchies no longer play such a dominant role; instead, an almost democratic culture of discussion and decision-making is increasingly emerging at companies. The top dog on the executive chair who takes himself a little too seriously is evidently on the verge of extinction.” ☒

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B767 Cabin Refurbishment Design for **Condor***
A321 Cabin Refurbishment Design for **Air Macau**

B747 First Class Seats for **Lufthansa**

Premium Economy Class Seats for **Lufthansa**

A380/A330/340/B747-8 First Class Lavatories for **Lufthansa**

EC145 T2 HEMS Rescue Helicopter Interior Design for **Bucher Leichtbau**

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livingthedream

The right combination of teamwork, innovation and skill can make dreams come true, as the Quantum seat design programme proves

- 01. By considering IFE from the outset, the display could be cleanly integrated
- 02. The world's largest economy-class IFE monitors: a good way to differentiate product



What if...? The combination of these two words has had a profound impact on the world as we know it today, flying boldly in the face of what is seen as being orthodox and business-as-usual. Recently the question was asked, 'What if an aircraft seat was designed around an integrated IFE system from inception instead of at the final stages of development as an afterthought?' Now, what if that seat were developed by an IFE technology titan, a rapidly growing aircraft interiors manufacturer, and a commercial aircraft interior design veteran?

Panasonic's CEO Paul Margis wanted to explore the full potential of an IFE-centred seat design. As a leader in IFE, with the most systems installed, the most airlines served, and 25 years of product innovation, the 'what if?' of seat integration is a natural question for Panasonic.

With the intention of designing a seat from the seat-track up, Panasonic sought out an experienced seat manufacturer. The ideal collaborator in this case would be a company with enough experience to get the job done, but not so much experience that the company has become risk averse. The search for this key resource led Panasonic to approach Encore

01



02



Aerospace's CEO Tom McFarland. Headquartered in Irvine, California, Encore is one of the fastest-growing aircraft interior manufacturers in the world today. The company has a thriving client base of both military and high-profile civilian accounts that have contributed to its sales increasing more than ten-fold in four years. This growth is dependent on pushing the design and manufacturing envelope, and always being prepared to take on a new challenge.

A THIRD PARTY As goals began to be outlined between the two large companies, it became clear to both Margis and McFarland that an experienced design firm should be brought in early on to facilitate discussions regarding process and

deliverables. Panasonic and Encore Aerospace immediately enlisted the help of ID Group Inc. Nestled in the heart of Huntington Beach, California, ID Group has an eclectic list of design clients, from consumer electronics companies to aircraft interiors suppliers, and every day at the company begins with 'what if?'

Although ID Group's portfolio for design work covers a vast collection of industries, it was a specific set of skills that lead Encore and Panasonic to the door. ID Group founder Jeremy Wilkens formed the company in 1997 after several years working as an industrial designer at a leading aircraft interior manufacturer. Few design firms understand the aircraft interiors and business like Wilkens. His background, combined with the talented team at ID



NOT EVERY PROJECT GETS THE ATTENTION OF TWO CEOs IN THE DESIGN PROCESS



Group, has established a proven track record for designing and transitioning concepts into reality.

With goals, expectations and timelines in place, ID Group quickly got to work establishing a visual direction for concepts. Image boards and concept sketches gave birth to the Quantum stylistic theme. Integration of technology with sleek, modern aesthetics and materials was to become the driving force behind the Panasonic seat concept.

“It was a great design project to be involved with as not every project gets the attention of two separate CEOs in the design reviews, and instantaneous, non-filtered feedback straight from the decision makers to the designers,” says Wilkens. “This was a crucial step in letting us hit our milestones.”

QUANTUM MECHANICS With the visual direction established, ID Group began refining concept sketches by the hundreds, looking for something new. The goal was seamless integration; a seat designed specifically for the technology it was going to house, forcing designers to re-think every part of the seat. Concept sketches revealed interesting ideas about seatback real estate and how to accommodate the largest monitor possible. Designers analysed the determining factors of seatback width in direct relation to the size of the monitor. Questions led to answers, leading to more questions. It became apparent that the critical element defining the seatback width lay in the armrest.

After designing a modular IFE seatback system, cleverly integrating

wiring into the carbon fibre seatback frame, and designing a seat pan with integrated space for video and power supply components, ID Group’s focus turned to developing a drop-down armrest that would allow the seatback to remain wide and allow a passenger transfer with no interference from the armrests. The challenge became how the armrest would articulate, release, and still be strong enough for testing.

“On paper it happened fast. It is always simple to sketch something out, but making it work is something entirely different,” says Wilkens. ID Group built prototype after prototype of the armrest mechanism – the basic concept coming to life relatively quickly, but the refinement stage proving more elusive. The release button location was intuitive to some,

- 03. The teams found that the armrests had a large influence on seatback width
- 04. The armrest in the lowered position



but not to others. About 20 people tried the seat and evaluated buttons, triggers, paddles and levers to make the armrest articulate in an intuitive, lightweight and simple way.

“Changing the paradigm of armrest mechanics is a lofty goal, especially for a fast-track programme; however, the added design benefit for the IFE system warranted the extra effort and long hours,” says Wilkens. The result was a delightfully simple yet strong system developed around a four-bar linkage concept. The drop-down armrest proved a viable means for making space for any IFE Panasonic offered.

PROTOTYPE With the visual language and initial mock-up seat at a comfortable point, the team had to quickly turn this concept into a functional seat prototype. Encore used its composite structures division to quickly and beautifully execute the thin composite structure of the seat.

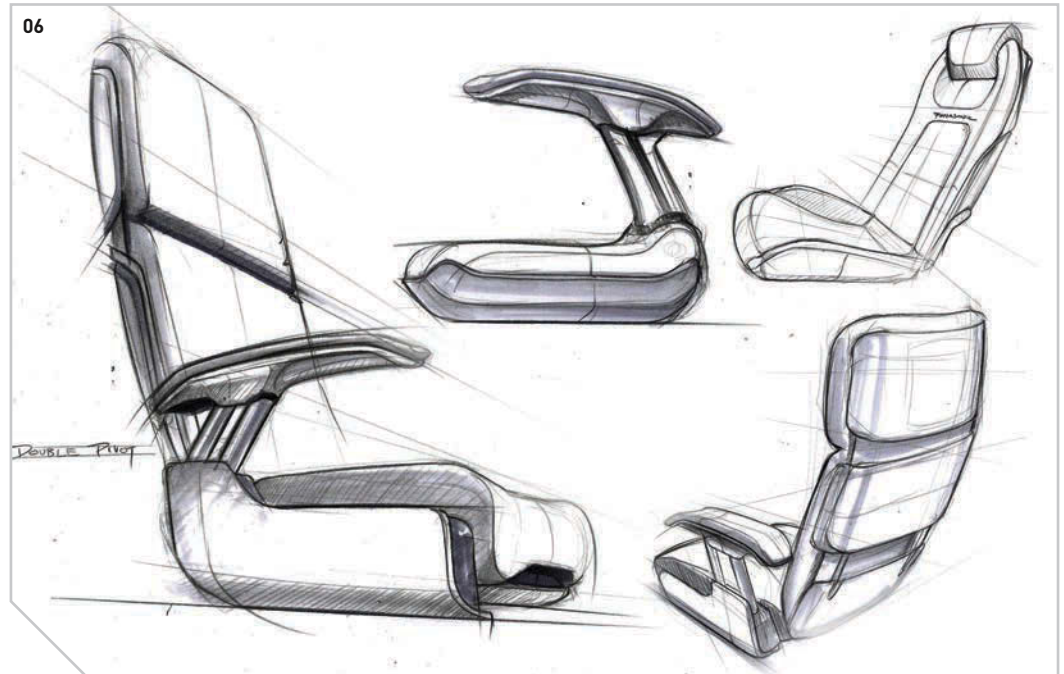
The design team took immediate notice of the quality of Encore’s carbon fibre components and made a last-minute decision to minimise the back shroud in order to expose the elegant pattern of woven carbon fibre. The remaining components of the seat were machined and prototyped at ID Group, whose in-house machining and rapid prototyping facilities were instrumental in making this project happen in time.

The seat was presented to both Encore and Panasonic for a final design review four weeks before the ship date. During this review, ID Group had integrated and accommodated the four best-selling IFE systems offered by Panasonic. The seat was elegant, thin, radically new, and the armrest was the point of much discussion.

“

CHANGING THE PARADIGM OF ARMREST MECHANICS IS A LOFTY GOAL, ESPECIALLY IN A FAST-TRACK PROGRAMME

”



05. Ingress and egress is eased by the armrest design
06. Technology, sleek styling and the latest materials were key elements of Quantum

BIG DISPLAY However, Panasonic CEO Paul Margis was missing something. He looked back at one of the original concept renderings of the seat as visualised with a large IFE monitor and asked if incorporating a 14in monitor could be achieved. His new goal and challenge for his team, less than a month before the prototype had to be shipped to Aircraft Interiors Expo in Hamburg, was to “try to make that happen. This is what the design is all about”.

The fact that Panasonic didn’t have a 14in IFE monitor started its product engineers on a fast-paced effort to prototype a much larger than normal monitor for the seat. In conjunction, ID

Group designers began to modify the modular shroud to accommodate this new requirement, both teams working back and forth to make this new innovation happen. As expected, Panasonic’s engineering team was able to provide ID Group’s designers with a 14in IFE monitor to be integrated into the new seat.

In the end, Panasonic was able to unveil the world’s largest economy seatback display at the Hamburg show. The Quantum seat is a beautiful example of collaboration between three companies who dared to explore what the future of aircraft seat design can be. Now close your eyes and just imagine... what if? ☒

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statementpiece

When communicating brand values to customers, good design is essential. Well-engineered monuments made from premium materials help convey quality



The word 'design' originates from the Latin *designare*, which means to mark out, designate, sign.

The design of an aircraft cabin interior aims to do just that: mark out, designate, sign, and in so doing, differentiate. It is this differentiation that enables an airline to apply its own feel and personality to its aircraft. Each aspect of the cabin interior that is unique to its airline subtly communicates that airline's qualities, standards and character. From the premium monuments to the handles on the overhead luggage bins, the look and feel of the cabin interior will convey a message; and quality is of course vital.

Designing a cabin interior is a difficult balancing act between artistic vision and the more practical aspects, including engineering capabilities, ergonomic requirements and safety standards. Over recent years, new materials have been introduced to the aviation industry. Many of these materials had previously been deemed unsuitable for use in an aircraft due to weight or safety concerns.

New technology has allowed not only for new materials to be used but also for them to be used in ways never thought possible. Premium monuments can now include granite, glass and even concrete. It is not just the new technology itself that is vital, but also the engineering skill to make

01. As you board a Qatar B787, a pair of monuments help make passengers feel welcome
02. Flowers are placed on the monuments for boarding, replaced with refreshments during flight as they become social areas





THE LOOK AND FEEL OF THE CABIN INTERIOR
WILL CONVEY A MESSAGE, AND QUALITY IS VITAL



03



04

it work and the vision to imagine the possibilities.

ICONIC Design and brand is vital in commercial aviation. It provides the passenger with a flight experience that is tied uniquely to that particular airline. The horseshoe bar located on the upper deck of the Emirates A380s has become truly iconic and demonstrates the level of differentiation and style that is possible on a wide-body aircraft.

DIFFERENTIATION Qatar Airways' 'five star' positioning required an equally high degree of differentiation on its B787 to that of the Emirates A380. AIM Aviation was engaged to assist in delivering that ambition.

At that time, Boeing's model for the B787 was to provide airline customers with a flagship aircraft, using a catalogue approach for the interior. This allowed for some customisation, but the options were ultimately limited. Qatar Airways' design ambition and desire for differentiation led it to specify a level of customisation that needed Boeing to step outside the boundaries of its catalogue approach, requiring acceptance that some customers would look for highly

customised and differentiated interiors for their aircraft.

Initially, Boeing required AIM Aviation to supply some customised monuments to Qatar's B787 Dreamliner programme through its existing Tier 1 supply chain. Boeing subsequently saw the value that the airlines and Boeing itself would gain in allowing these monuments to be supplied on a buyer furnished equipment (BFE) basis. As a result, AIM Aviation was appointed to offer BFE for monuments on the B787 platform, a first for the entire B787 programme.

VISION The design schemes sought to utilise finishes that brought depth and contrast to the pristine white interior of the Qatar B787. From below the main working surfaces, the units all narrow to the floor in a way that is reminiscent of a classic hourglass figure.

The passengers board at door two, which is the location for the two working bars. AIM Aviation's vision was to create a wow factor; a metaphorical handshake when passengers entered the aircraft. AIM Aviation used a rare labradorite stone for the surface of the bar. This always feels cold to the touch and provides the desired 'handshake' effect for passengers.

03. The horseshoe bar on board Emirates' A380s
04. The wood finish of the bar is echoed in the lounge area



The composite up-stands are finished with AIM Aviation's own Chameleon aqua printed wood finish, complementing the dark hue of the stone. The wood finish is polished to a high gloss to exude quality. The bars are completed with a translucent light feature to warmly light the service area. In addition, the magazine rack has two illuminated magazine presentation recesses, large enough to present 10 magazines.

FRONT ROW With the front row units, AIM Aviation had the opportunity to make the prime seats on the Qatar B787 particularly special, to reflect the highly desired nature of seat 1A. The seating is angled in a 1-2-1 formation. Each passenger's footwell extends under the credenza of the passenger in front. With no seating in front, it was possible to widen the footwell for the first row passengers, to give a more comfortable bed space. More personal stowage space was also created. These VIP front row seats are now offered to Qatar Airways' frequent flyers.

FIT, NOT RETRO While the Qatar B787 offered many design and engineering challenges, the team had the benefit of being able to design a new-build interior from scratch. It is hard enough to strike the balance between aesthetics, engineering capabilities and practical requirements when the interior is designed for a new aircraft. When the interior is a retrofit, the solutions must inevitably be even more creative.

REVITALISATION The main elements of any cabin interior retrofit are revitalisation and standardisation. In-service aircraft inevitably suffer from



wear and tear, but also from outdated design and materials. Of course, giving an aircraft a fresh look requires rather more than a lick of paint. Reconfiguration is often required in order to make an aircraft work for a particular airline.

It is often the more subtle changes and updates that give an aircraft a really modern look. Lighting is essential in setting mood and zoning areas. A cabin divided in the right ways will feel more spacious and airy.

It is possibly the use of new materials that has brought the biggest change to retrofit cabin interiors. Although the passengers may need

05. An AIM employee assembling an A380 header panel
06. The cosmetics shop on board Air Korea's A380, manufactured by AIM Aviation

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TO BOTH
DIFFERENTIATE
AND STANDARDISE
A CABIN INTERIOR,
ATTENTION TO DETAIL
IS THE KEY”

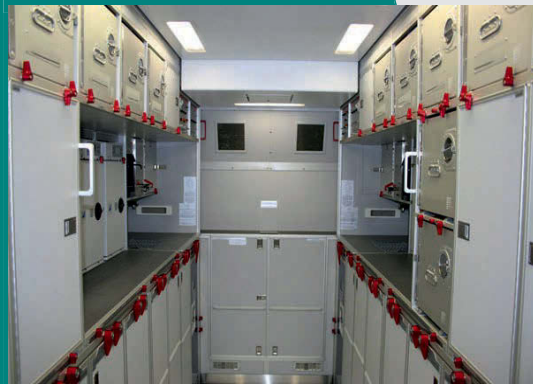
to be pretty observant to immediately notice the airline's use of the latest, innovative materials, the overall feel of a modernised interior will instantly be obvious.

STANDARDISATION While differentiation is a vital element for any airline, it is standardisation that is essential in order to achieve customer recognition and acceptance of the brand. To both differentiate and standardise a cabin interior, attention to detail is the key. It is the premium monuments and first-class bar areas that will draw the attention of the passenger, but it is the consistency, continuity, design and engineering of the galleys, stowages and dog boxes that signal the underlying message of quality.

BRAND Essentially, an airline is a brand. What distinguishes one airline from another is its ideology, ethos, people, service, look, feel, quality and atmosphere. The word 'brand' means a distinctive symbol to show ownership. In the traditional marketing sense, an airline's brand is its colours, logo and uniforms. However, in terms of the customer's recognition and trust, it is often the altogether more subtle details of design and quality that convey an airline's message. ☒

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keeppace

Cabin configuration has never been so involving, with immersive 3D views, performance analysis and even sales and marketing capabilities now at hand

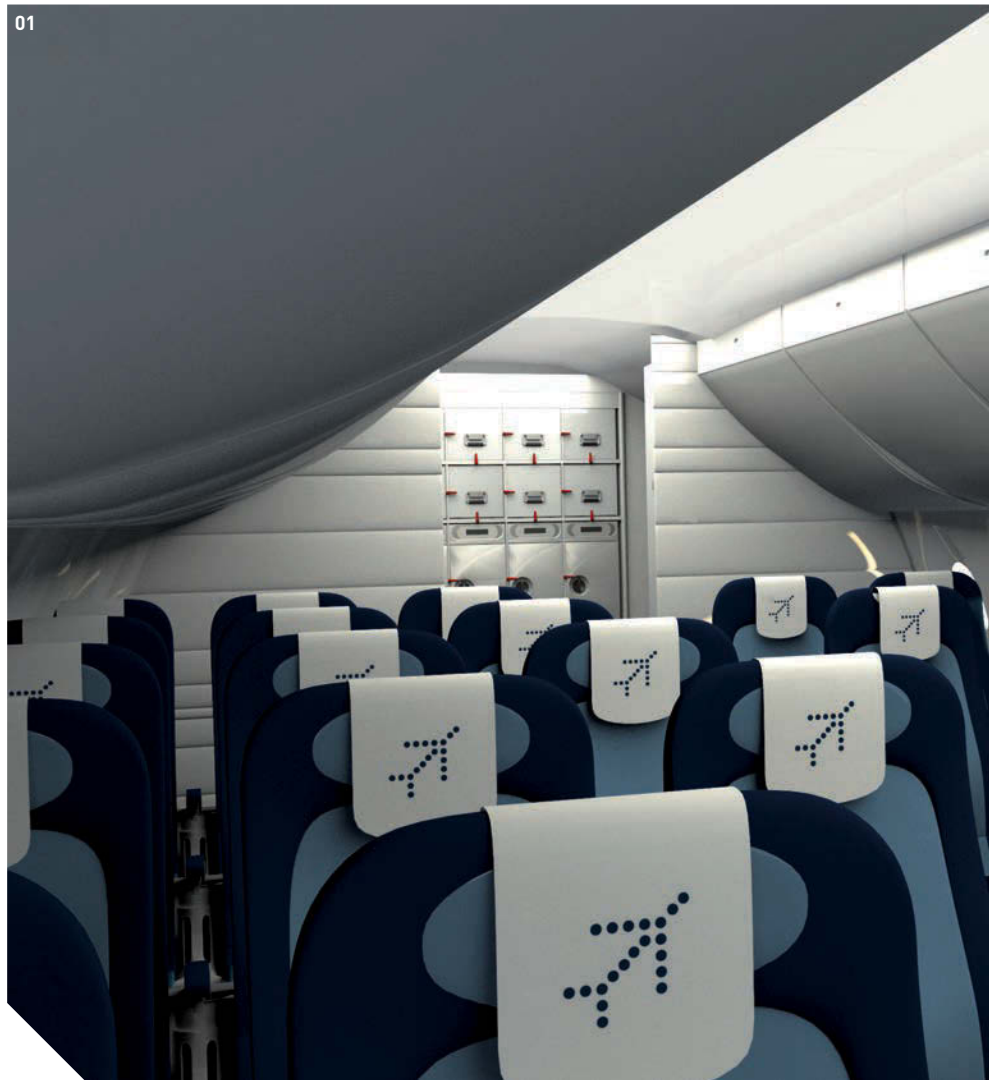


After successfully launching a wholly new generation of its configuration software – Pancelab Cabin – in the context of Airbus’s A350XWB programme in early 2012, Berlin-based provider of aerospace engineering software solutions Pace has recently made the upgraded functionality available for all types of aircraft, from corporate jets to large multideck commercial aircraft.

“Pancelab Cabin 7 represents a major functional overhaul, which was not only driven by the natural advancement of software technology, but because the practice of selling and buying aircraft has changed considerably over the years,” explains Frank Ehlermann, Pace’s vice president of sales. “With Release 7.4, we also encourage long-standing customers of our configurator to upgrade to the latest generation.”

Since its market debut in 2000, Pancelab Cabin has been used by aircraft manufacturers and airlines to set up, optimise and validate LOPAs for cabin studies, competitor analyses and cabin refurbishment projects. What distinguishes Pancelab Cabin from other packages, such as CAD tools, is the rich domain knowledge that is encapsulated, for example, in the real-time compliance checks. In the face of limited physical space, a seemingly endless list of rules and regulations, the varying comfort and service requirements and changing selling policies, this as-you-go quality control ensures that only valid configurations can be created.

In addition, the latest generation includes major enhancements for sales and marketing applications, such as advanced 3D imaging, the ability to build a product catalogue, and a user interface designed for customer interaction. The result is a powerful sales configurator, which supports an effective communication of product features, configuration



options, technical and certification requirements, and pricing. And because, as a customer-facing tool, Pancelab Cabin 7 contributes to the brand image of the aircraft manufacturer or cabin equipment supplier, the user interface is fully configurable and can be easily adapted to comply with any corporate style, as is the case with the Airbus A350 XWB Configurator.

Version 7.4 uses many of the insights gained in the course of the A350 XWB Configurator project.

The new version includes a built-in editor for creating parametric models of buyer-furnished equipment, which is especially helpful if cabin item models are not supplied in a compatible format, or not supplied at all.

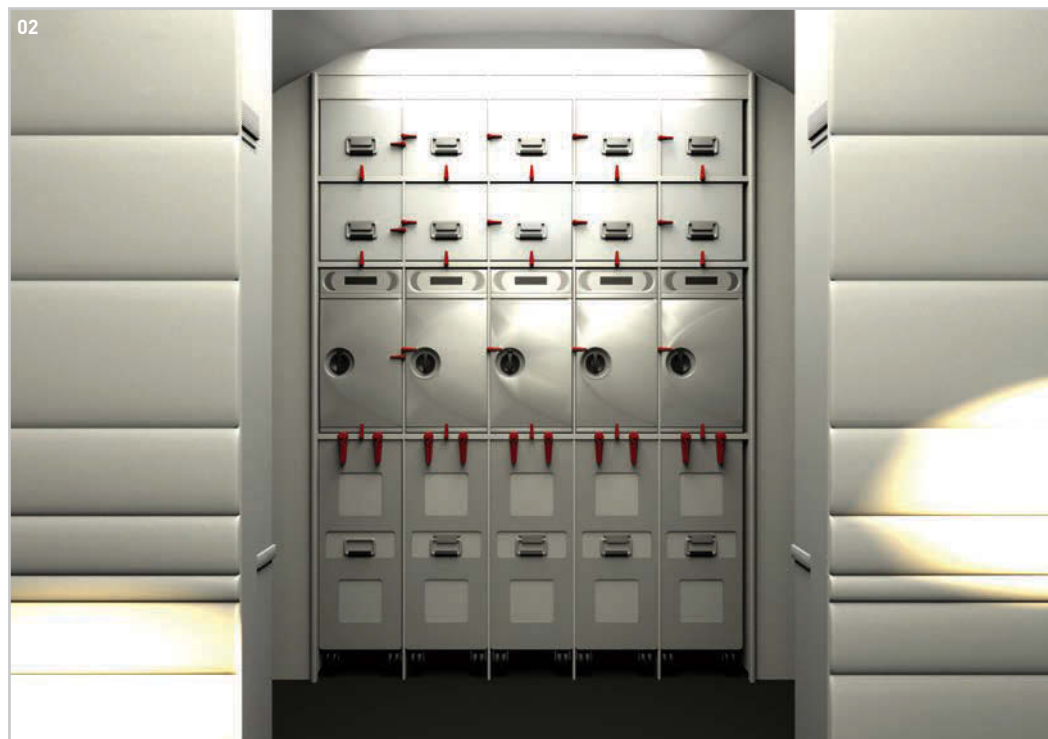
In addition, the 2D, or LOPA, view has been optimised for compatibility with AutoCAD, and supports importing and exporting proprietary AutoCAD file formats. This is useful for generating technical drawings and contractual documentation. Enhancements have also been

01. High-quality rendering of a cabin configuration



introduced to the 3D view, which now uses stereoscopy to enhance the illusion of depth and to create an even more realistic cabin.

Ehlermann believes that the 3D cabin simulations have an instant appeal to customers: “Being able to move through the cabin and look at the configuration from every angle engages people and invites them to take a creative approach. Most of us are visual thinkers – and that makes product configurators such compelling sales tools.”



However, the largest functional additions in Release 7.4 are the enhanced central data management and user management capabilities. The data management feature allows for integration of all catalogue and project data into one central server-based repository over the entire lifecycle, including geometric and computational models, types and options, and rules and report templates. A systematic and automatic data transfer to and from this repository data ensures that there is an information flow without gaps or data loss, and consistent and up-to-date information is available to authorised users at any time, either locally or remotely. Access to configuration data and functions is controlled by a fine-grained state-of-the-art user management system.

The response to these new features has been good, says Ehlermann: “We have received a lot of encouragement, both from long-standing users of

Pacelab Cabin and prospective buyers. We had, for example, an incredibly busy Aircraft Interiors Expo in Hamburg, with a constant stream of visitors keen on previewing the tool.”

He muses that this may have been partly due to the attention around the A350 and adds, “We have profited from the A350 XWB Configurator project in more ways than one.” The open communication with Airbus during the deployment and roll-out of the A350 XWB Configurator helped Pace to identify areas in which customers may run into difficulties. The company has responded to this by extending its consulting and data preparation services to ensure its clients get the most out of the software and get fully operational as soon as possible.

Having successfully re-launched its cabin configuration software, Pace now strives for a stronger integration of payload configuration and aircraft performance analysis. The company’s

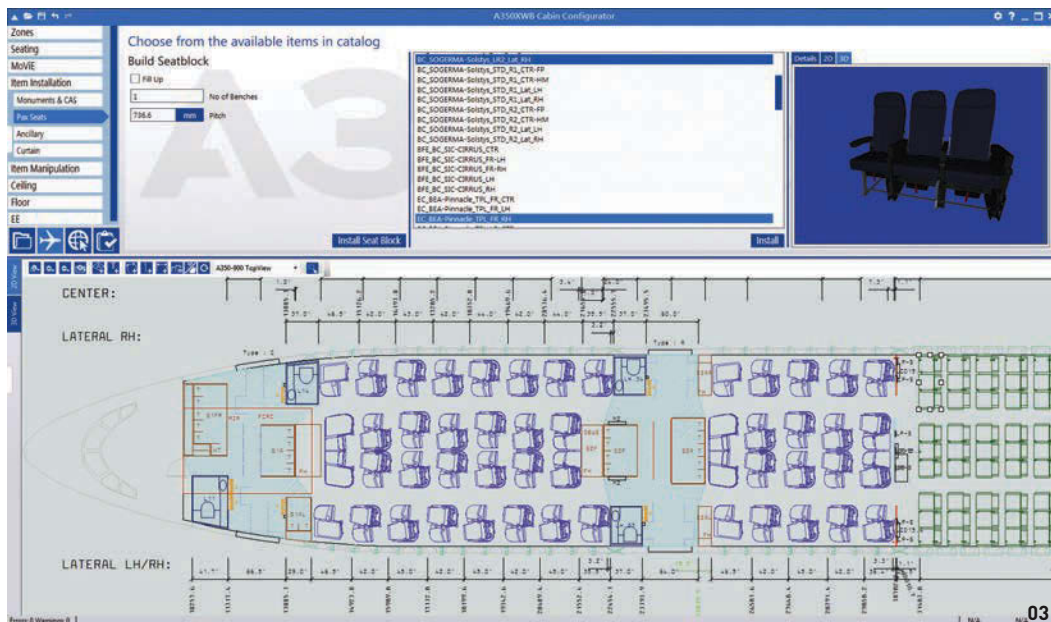
02. A high-quality rendering of a galley configuration



WE PERCEIVE A STRONG DEMAND FOR A NEW STYLE OF AIRCRAFT SALES AND MARKETING TOOLS



- 03. A custom-skinned Airbus A350 Configurator
- 04. Project lifecycle management and real-time cabin rendering

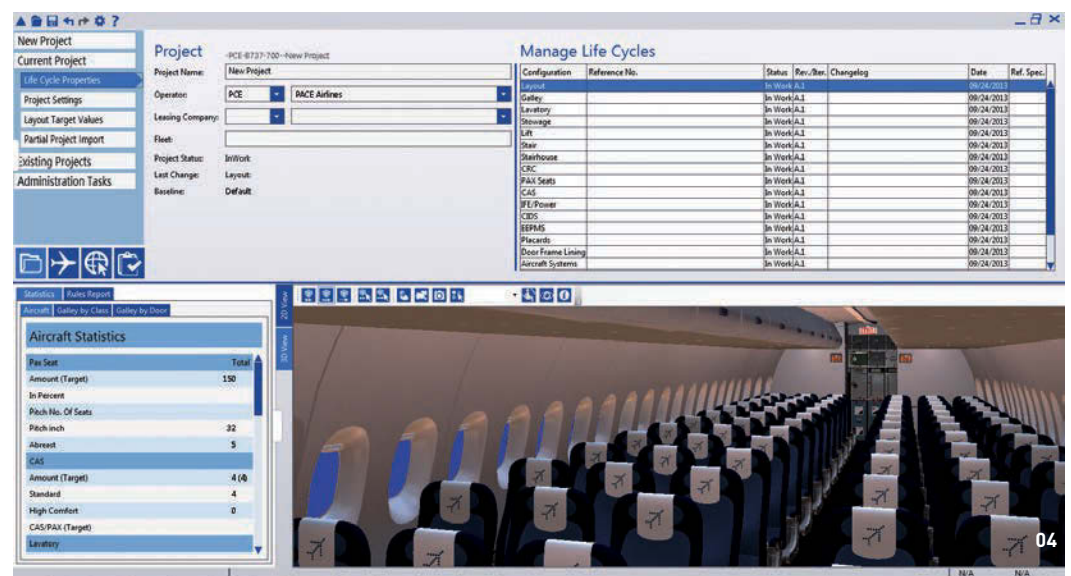


networks, fuel policies and other key aspects, to give buyers a clear understanding of their options.

Another central characteristic shared by these applications is that they are specifically designed to facilitate communication and to engage customers more directly throughout the entire sales process. Pace envisions its customers establishing client-facing web portals, which provide 24/7 access to all transaction details, including configuration data, revision history and contractual documents. Ehlermann believes these tools embody two simple rules that are at the heart of every successful sale: “Make it easy to buy your product and help prospective buyers feel confident in their purchasing decision.”

latest product development, the Pacelab Mission Suite, addresses aircraft performance and economics, which, together with the configuration of the aircraft interior, are the key points influencing the purchasing decision. “We perceive a strong demand for a new style of aircraft sales and marketing tools that drive and elevate the purchasing process,” explains Ehlermann.

The Pacelab Mission Suite, a major upgrade of Pace’s Pacelab Mission off-the-shelf route analysis software, is expected to be completed next year and will enable sales teams to quickly set up detailed customer-specific operational settings in which to demonstrate the merits of their products above those of their competitors. It will allow complex trade-offs between aircraft, route



Contact: info@pace.de
Web: www.pace.de

The background of the entire page is a photograph of an airplane cabin. It shows two windows with white frames, through which a blue sky with white clouds is visible. The seats are upholstered in a blue and white striped fabric. A white tray table is extended from the seat in the foreground, featuring the 'PACE' logo. The overall lighting is bright and clean.


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positive thinking

Innovative thinking has led to the multifunction monument being redefined, the bar being raised for crew rests, and a renewable interior product being developed

 TTF lives to innovate. Well over a year before 9/11, TTF was designing reinforced cockpit doors and differential pressure valves to make flight decks impenetrable. Later, it was TTF that came up with a low-cost air purification system during the SARS epidemic in Asia. And it was TTF that designed a new lavatory shell to utilise the same components from an airline's existing lavatories.

It was TTF engineers who invented an effective, lightweight sound deadening panel for crew rests. And it was TTF that perfected the multimodule, multicompartiment lower lobe crew rest. Lower lobe crew rest install/remove times have been optimised by utilising large-scale modules and incorporating cargo restraint system components for lighter weight, palletless units.

The TTF team loves to look at a problem and then brainstorm with a customer to solve it. There is no solution unless it is one that works for the customer, within their framework, their timeline and their budget. TTF works hard to give the best quality product possible, and believe its end products speak for themselves.

Every problem has multiple possibilities, but TTF likes to pick the three best ones to present to its customers. And as ideas take shape, the mantra of presenting the three best ideas every time a design requires a 'fork in the road' decision is repeated. So in keeping with that idea, let's take a look at three of TTF's projects.

CUTTING-EDGE CREW RESTS Five years ago, a customer asked TTF to create a new crew rest for its wide-body fleet. It didn't want to lose any revenue seats, so an upper lobe solution was not practical. In the interest of promoting the best use of all aircraft spaces, a lower lobe crew rest was proposed, situated in the under-utilised



01. It wasn't easy, but space was created for five bunks

“

CREATING A FIVE-BUNK CREW REST IN THIS LIMITED SPACE RAISED ENORMOUS ISSUES

”


01

bulk cargo compartment. Of course, all grand ideas look great on paper, but creating a five-bunk crew rest in this limited space raised enormous structural, noise, temperature and crew safety issues.

Structural modifications were made, including cutting floor beams and installing hatches, as well as numerous systems modifications. Designing and substantiating a mounting system that allowed the crew rest to float inside the swimming tail of a wide-body while still interfacing with a main deck staircase was also an interesting challenge. And cooling the lower back end of a superheated aircraft sitting on the tarmac in the tropics proved to be no small feat, either.

To address safety concerns, TTF also developed aircraft-qualified carbon dioxide and low-airflow alarm systems. TTF's proprietary soundproofing composite panel also successfully combated the over-90db noise from high-output chillers that were located just 20in from the crew rest. Without using insulation, TTF was able to reduce noise levels inside the crew rest to less than 70db.

Lastly, there was the wastewater system redesign that required numerous flight endurance and passenger use studies to determine the correct size of the larger holding tanks, as well as where to relocate them to maximise remaining bulk cargo space. Combined with an interior main deck reconfiguration, TTF provided more than 15,000 parts per shipset for this project.

TTF's latest crew rest design is its most complex and successful yet, made of carbon fibre and housing eight flight crew members in two separate compartments of the same crew rest module. The company offers a range of innovative crew rest units housing two, four, five or eight crew members for multiple B767 models, the B777 and the A330.



TTF ENGINEERS CREATED A MULTIFUNCTION MONUMENT WITH THE SAME FOOTPRINT AS THE ORIGINAL



MONUMENT MULTITASKING As part of the lower lobe crew rest, TTF was also asked to incorporate vestibule, staircase and galley components into a monument using the same footprint as the existing aft centre galley. That did not present a problem, but the customer also wanted to keep the same amount of galley stowage space in the new monument. This was a problem.

Ultimately, TTF's engineers used their imagination and succeeded in creating a multifunction monument with the same footprint as the original, which still housed all the galley carts and stowage the customer needed. The GalleyBule was born.

GOING GREEN Unless you were at 2012's Crystal Cabin Awards, you may not know about the T-Skin patent-pending product. Spawned from a customer's wishful thinking at a tradeshow, the idea took hold – create a removable film that resists punctures, tearing and marking for the inside of stowage bins.

The film can be applied as a peel-and-stick product, so it can be removed at any time without leaving a residue, and replaced with no prep work. Crew can literally just peel off the old layer and stick on a new one – and do that as often as they want, with no additional prep work. T-Skin is far from being a decorative laminate; it is much more versatile and easy to use.

T-Skin can be used to replace original paint without repainting. It reduces punctures and scuff marks, and is recyclable without special handling. This product has been proven with more than two years



02. The crew rest still interacts with the main deck staircase

of in-service experience, and is a lightweight alternative to painting or, in some cases, decorative laminate.

In addition, because T-Skin can be printed in custom colours or graphics, it can be put to work as an advertising medium. The product can even be used on the sides of galley carts for advertising and to keep the galley carts looking fresh and clean as they go up and down the aisles.

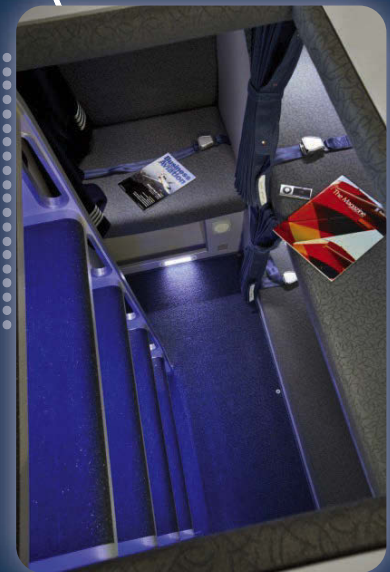
IDEAS AND CHALLENGES Working with new thoughts and ideas, no matter where they come from, to develop new solutions and products, is at the very core of TTF's make-up and its mission. Giving customers what they want, not what TTF thinks they want, is also what the company strives to provide. The TTF team doesn't just stop once it has made a couple

of attempts at solving an issue; the company believes there is no option other than success.

TTF strongly believes that actively listening to customers' needs and their ideas about solving them provides a great base to evolve a discussion into the highest and best solution for them. That cannot be accomplished until their needs and ideas are listened to and understood.

Granted, at times TTF acts as devil's advocate to highlight possible shortcomings in an idea, but it also comes to the table with solution-based options to address them. So whether it is a straightforward or complex requirement, TTF's goal is to listen to customers and do its best to make their vision a reality. And, if suggestions can be made that improve upon their idea, so much the better. ☒

Contact: sales@ttfaero.com
Web: www.ttfaero.com



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AIM AVIATION

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B/E AEROSPACE ADVANCED DESIGN

CAON STUDIO

DESIGNSCENCE

FACTORYDESIGN

ID GROUP

JPA DESIGN

MORMEDI

MÜLLER/ROMCA INDUSTRIAL DESIGN

PACE AEROSPACE ENGINEERING & IT

PEARSONLLOYD

PIERREJEAN DESIGN STUDIO

PRIESTMANGOODE

SEYMOURPOWELL

TANGERINE

TEAGUE

TTF AEROSPACE

TXS INDUSTRIAL DESIGN

ZEO



AIM AVIATION

LOCATION: UK

FOUNDED: 1926

EMPLOYEES: 800

WEB: AIM-AVIATION.COM

EXPERIENCE: AIM Aviation's integrated team of designers and engineers realises and certifies concepts. The initial vision of AIM's own industrial designers or external agencies is translated into design that works aesthetically and ergonomically, has durability and, above all, is certifiable – all while maintaining the original design intent. AIM Aviation has realised and certified projects such as: Virgin's A330 bar, mood lighting system and cabin monuments; Emirates' A380 horseshoe bar and water feature; and Qatar's B787-8 bar and front row furniture.

EXPERIENCE: Design, manufacture and supply of premium customised monuments for airlines and Boeing, as well as BBJ and VIP787 completions, maintenance and refurbishment.

B/E AEROSPACE ADVANCED DESIGN GROUP

LOCATION: WINSTON-SALEM, NC, USA

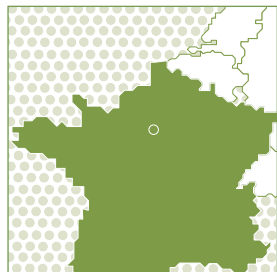
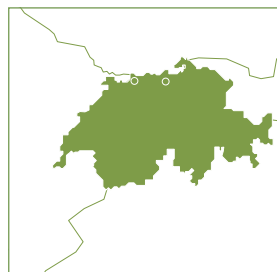
FOUNDED: 1987

EMPLOYEES: 8,800+

WEB: BEAEROSPACE.COM

EXPERIENCE: B/E Aerospace is a world-leading manufacturer of aircraft cabin interior products and a world-leading distributor of aerospace fasteners and consumables. The B/E Aerospace Advanced Design Group is an award-winning leader in the design and development of cabin interior products.

EXPERIENCE: David Caon, creative director, has extensive experience in the aviation sector. As a former senior member of the Marc Newson Limited design team, Caon completed the Qantas A380 interior and A330 Skybed Interior. Caon Studio was founded in 2009 and has completed the QantasLink 717 Interior and Qantas Premium Lounge in Singapore.



DESIGNSCENCE

LOCATION: TOULOUSE, FRANCE

FOUNDED: 2010

EMPLOYEES:

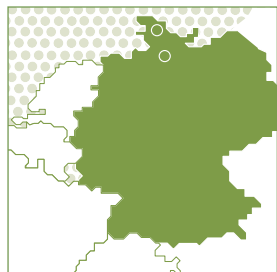
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WEB:

DESIGNSCENCE.COM

EXPERIENCE:

Designscence clients include Air Transat; Air Tahiti Nui; aircraft OEMs; and an Asian seat manufacturer (seat design). The consultancy is part of The Aero Experts Group, a consortium providing aviation consulting, industrial design and engineering services for the aviation industry worldwide.



ALTITUDE AEROSPACE INTERIORS

LOCATION: AUCKLAND & CHRISTCHURCH, NEW ZEALAND

FOUNDED: 2008

EMPLOYEES:

UNDISCLOSED

WEB: ALTITUDE-AI.COM

CAON STUDIO

LOCATION: SYDNEY, AUSTRALIA

FOUNDED: 2009

EMPLOYEES:

UNDISCLOSED

WEB: CAONSTUDIO.COM

FACTORYDESIGN

LOCATION: LONDON, UK
FOUNDED: 1997
EMPLOYEES: 16
WEB: FACTORYDESIGN.CO.UK
EXPERIENCE: This studio's portfolio of airline clients includes British Airways (Concorde, Club World Kitchen, World Traveller Plus); Etihad Airways (A380 and B787); Jet2.com; Singapore Airlines; and Virgin Atlantic. The studio has also helped design seats direct with suppliers.

ID GROUP

LOCATION: CALIFORNIA, USA
FOUNDED: 1997
EMPLOYEES: 8
WEB: IDGROUP-INC.COM
EXPERIENCE: ID Group is a multidisciplinary design consultancy providing research, strategy, conceptualisation and innovation services for the aircraft industry. ID Group provides a vertically integrated strategy to align the vision of its clients with the end-user experience, manufacturing feasibility and client profitability. ID Group provides innovative design with solid aircraft experience.

JPA DESIGN

LOCATIONS: LONDON, UK; SINGAPORE
FOUNDED: 1982
EMPLOYEES: 30
WEB: JPADESIGN.COM
EXPERIENCE: JPA has over 30 years' experience of delivering design solutions to the transportation and

hospitality industries. Customers include Singapore Airlines, American Airlines, Air China, Cathay Pacific, Dragonair, Gulf Air, US Airways, Oman Air and Japan Airlines. JPA designed the successful Cirrus seat platform with Zodiac Aerospace and recently launched another ground-breaking seat with Jamco. JPA designs have won Skytrax Best Business Class awards five times in the past seven years.

MORMEDI

LOCATION: MADRID, SPAIN
FOUNDED: 1998
EMPLOYEES: 20
WEB: MORMEDI.COM
EXPERIENCE: Mormedi is a strategic design consultancy, well-versed in product and service strategy and specialised in projects with a high level of innovation. What sets Mormedi apart is its diverse activity across different industry sectors and geographies, having designed customer experiences (products, services and digital experiences) for airlines, public transportation operators, banks, telecomms providers, consumer electronic manufacturers and home appliance manufacturers, among others. Mormedi's latest creation, the new business cabin for Iberia's new A330 fleet, was launched this year.

MÜLLER/ROMCA INDUSTRIAL DESIGN

LOCATIONS: HAMBURG &

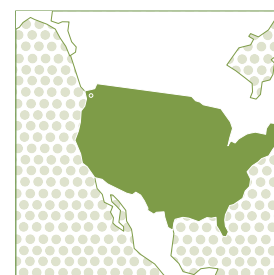
KIEL, GERMANY
FOUNDED: 1993
EMPLOYEES: 6
WEB: MUELLERROMCA.DE
EXPERIENCE: Aircraft interior design for clients including Lufthansa (premium economy, B747 first class, A380/330/340/B747-8 first-class bathrooms); Condor (B767 refurbishment); Air Macau (A321 refurbishment); Bucher Leichtbau (EC145 rescue helicopter); Diehl Comfort Modules (lavatories for the entire Airbus long-range fleet); and Diehl Aerospace (interactive exhibition system, interactive cabin configurators).

PACE AEROSPACE ENGINEERING & IT

LOCATION: BERLIN, GERMANY; SEATTLE, USA
FOUNDED: 1995
EMPLOYEES: 60+
WEB: PACE.DE
EXPERIENCE: PACE is a leading provider of cabin configuration software.

PEARSONLLOYD

LOCATION: LONDON, UK
FOUNDED: 1997
EMPLOYEES: 12
WEB: PEARSONLLOYD.COM
EXPERIENCE: This studio has extensive experience in furniture and product design R&D in workplace, transport, healthcare and urban environments. Virgin Atlantic Airways 2001-2006 (Upper Class Suite, premium economy, economy); Lufthansa 2007-2012 (business class); and consultant to Transport for London 2006-2012.





PIERREJEAN DESIGN STUDIO

LOCATION: PARIS, FRANCE
FOUNDED: 1980
EMPLOYEES: 15
WEB:
 PIERREJEAN-DESIGN.COM
EXPERIENCE: Emirates (first-class mini-suites and showers); Qatar Airways; Etihad (business class); and numerous VIP/head-of-state wide-body projects and mega-yacht interiors.



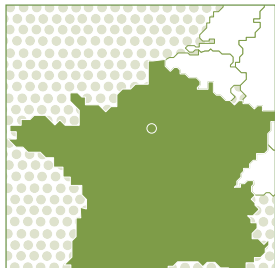
PRIESTMANGOODE

LOCATION: LONDON, UK;
 QINGDAO, CHINA
FOUNDED: 1986
EMPLOYEES: 37
WEB:
 PRIESTMANGOODE.COM
EXPERIENCE: Clients include Airbus, Embraer, Lufthansa, Swiss, Malaysia Airlines, TAM Airlines, Turkish Airlines, Thai Airways International and Qatar Airways.



SEYMOURPOWELL

LOCATION: LONDON, UK
FOUNDED: 1984
EMPLOYEES: 95
WEB:
 SEYMOURPOWELL.COM
EXPERIENCE:
 Seymourpowell provides a range of research, design strategy and design and innovation services, including rail exterior and interior design for Bombardier, Siemens, Midland Mainline and Alstom; aerospace interiors including cockpit, seating and linings for Virgin Galactic, Bell helicopter, Bombardier Jet, Lufthansa



Technik and Cathay Pacific; automotive interior and exterior design and innovation for Ford UK, USA and Ingeni group, Toyota, Honda and GM; automotive two-wheeler development for BMW, MuZ, Yamaha, Hong Leong, TVS Suzuki (India) and Intelligent Energy.

TANGERINE

LOCATION: UK; KOREA;
 BRAZIL
FOUNDED: 1989
EMPLOYEES: 25
WEB: TANGERINE.NET
EXPERIENCE: Cabin interior design for clients including Asiana, B/E Aerospace, British Airways, Korean Aerospace Industries (KC-100), plus strategic design direction on the Heathrow Express First Class carriage. Tangerine also designs consumer electronics, domestic appliances and develops brand strategy for clients in most sectors of industry. Tangerine delivers groundbreaking innovation and designs that make consumers happy and businesses profitable.

TEAGUE

LOCATION: SEATTLE, USA;
 MUNICH, GERMANY
FOUNDED: 1926
EMPLOYEES: 300
WEB: TEAGUE.COM
EXPERIENCE: Teague has been defining the passenger experience for more than six decades. Clients include The Boeing Company, Boeing Business Jets,

B/E Aerospace, Panasonic Avionics, Rockwell Collins and countless airlines around the globe, including ANA, Cathay Pacific, Emirates, Southwest and Virgin Australia.

TTF AEROSPACE

LOCATION: AUBURN,
 WA, USA
FOUNDED: 1999
EMPLOYEES: 155
WEBSITE: TTFAERO.COM
EXPERIENCE: TTF has extensive experience in galleys, lavatories, crew rests, overhead stowbins and aircraft interiors.

TXS INDUSTRIAL DESIGN

LOCATION: TEXAS, USA
FOUNDED: 1986
EMPLOYEES: 17
WEB: TXSDESIGN.COM
EXPERIENCE: Seating, R&D, brand, user experience, interiors and prototyping for airlines worldwide. Product design and development for transportation, consumer products, medical, lighting and telecomms.

ZEO

LOCATION: HUNTINGTON
 BEACH, CA, USA
FOUNDED: 2011
EMPLOYEES: 57
WEB:
 ZEOSTUDIOS.COM
EXPERIENCE: As the design and innovation studio of Zodiac Aerospace, ZEO offers design, integration and prototyping of the full range of aircraft interior products.

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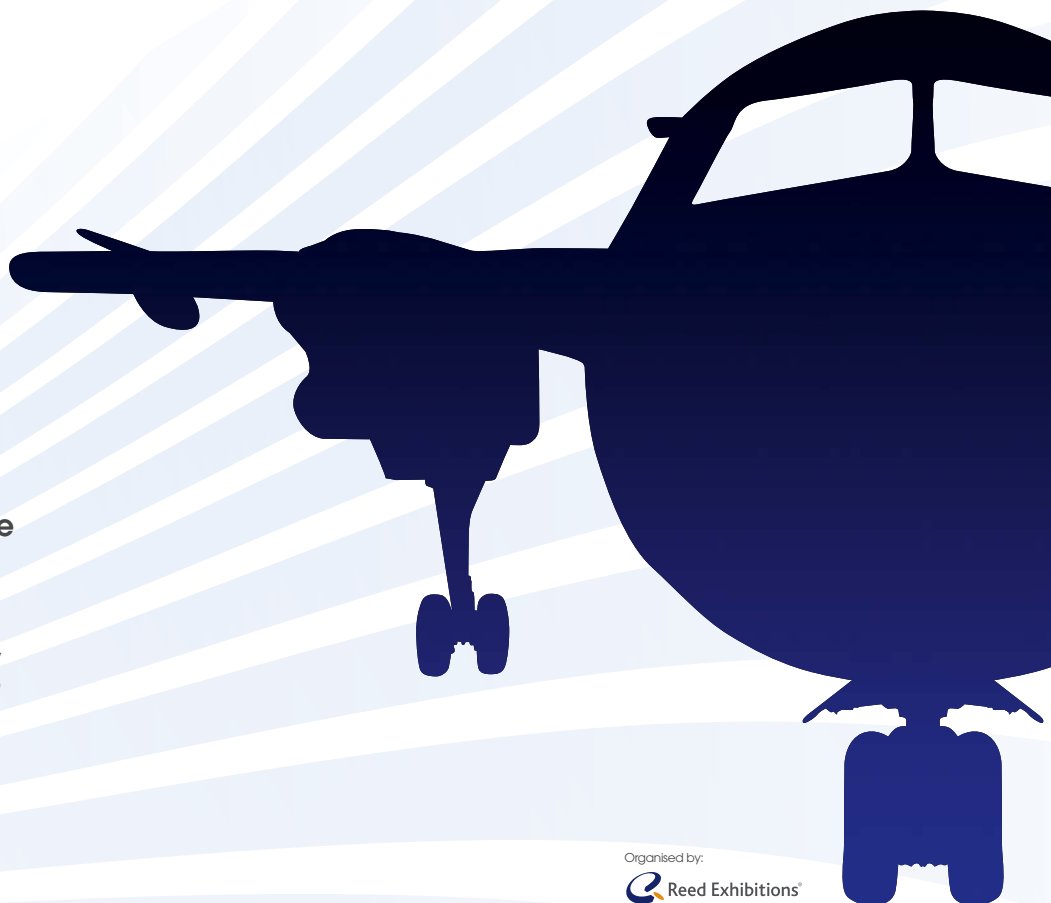
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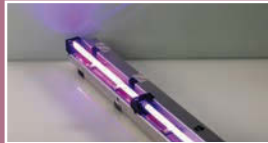
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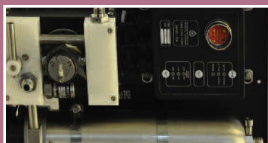
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


EMTEQ
150

SUPPLIERSHOWCASE

guidinglight

Recaro has embarked on a clean-sheet engineering programme to create its most comprehensively developed product yet: the CL3710

 Weight plays a strategic role in the highly competitive air travel market. With today's high aviation fuel prices, every kilogram saved allows airlines to save money. But focusing exclusively on the weight of the seat is a short-sighted approach. The seats also have to provide passengers with a high level of comfort and space, and need to be high quality and maintenance friendly. With its CL3710, Recaro Aircraft Seating is launching a new generation of products that meet these requirements. Backed by years of expertise in design and ergonomics as well as in lightweight design, the aircraft seat supplier is highly rated as a driver of innovation.

Aircraft seats need to meet the contradictory needs of airlines. Airlines want lightweight seats in order to reduce the fuel consumption of their aircraft fleets. Also the total number of seats is an important factor in determining the profitability of an aircraft. Airlines are therefore increasingly equipping their aircraft with slim-line seats to make optimal use of the available cabin space. At the same time, airlines are looking for more comfort and legroom to please their passengers with the best level of service and most comfortable experience during their flights. The importance of passenger comfort has been confirmed by several studies such as the latest 2013 Consumer Report by the Federal Association of German Aviation and Space Industry (BDL: Bundesverband der Deutschen Luftverkehrswirtschaft). This representative survey of the German market found that seat comfort was an important factor for 93% of passengers, but only 66% of those questioned were pleased with this aspect of their last flight.

In an intensively competitive environment, meeting passengers' needs is critical for airlines. Recaro Aircraft Seating has made it a mission to meet the requirements of cost-

01





THE CL3710 ECONOMY SEAT IS THE IDEAL COMBINATION OF DIVERSE FACTORS



02

efficient solutions on one hand and customer-orientated, comfortable products on the other.

Dr Mark Hiller, CEO of Recaro Aircraft Seating, explains: “With our latest product generation, we are delivering a solution to what, at first glance, appear to be contradictory demands: the CL3710 is the ideal combination of diverse factors. By combining maximum individual space and comfort with exceptional light weight, we have once again set new standards for long-range flights in economy class.”

THE CL3710 The CL3710 seat model represents the most comprehensively developed new product that Recaro Aircraft Seating has ever made. A team of more than 50 product managers, engineers, designers, ergonomists and sales experts has been working for more than two years on the project. Starting from scratch with the proverbial blank sheet of paper was a conscious decision for the engineering team. They wanted to be able to look at all the options without self-censorship.

The idea was to develop something totally new, allow space for creativity, and also ensure the best possible atmosphere for ideas.

In developing the product, Recaro pursued a new philosophy: the seat was developed without a special customer order. “Rather than attempting to fulfil the specifications of individual customers, we have taken the needs of our worldwide customers into account in a universal manner,” says Dr Hiller.

Recaro started by taking a close look at the market and its customers, researching what the airlines need, what will define the industry in the future, and what passengers want. CEO Hiller says, “We have carefully focused on the demands of different markets, regions and airlines. We have developed a modular seat generation that essentially meets the needs of our global customers.”

The result is a modular system that meets the requirements of the airlines to be able to customise the seats. The CL3710's modular design enables it to be optimally adapted at standardised

- 01. The CL3710 is the result of a two-year, clean-sheet project
- 02. A multifunction bridge in the backrest enables many configurations, depending on airline preference



interfaces to airline requirements. The seat's multifunction bridge, located in the backrest, for example, permits numerous unique configurations. It combines a variety of functions – from the high literature pocket and tray table latch, to USB ports, power outlets and other components. The CL3710 also offers numerous IFE integration possibilities. For example, a 12in video monitor can be integrated into the rear of the backrest in combination with a high literature pocket.

The CL3710 offers maximum shin clearance at seat pitches starting at just 29in. This is a result of features such as the patented high literature pocket, placed above the tray table. Two more innovative details created by the Recaro team add a few decisive millimetres. One of the two beams under the seat structure is positioned slightly forward. This, combined with the solution of positioning the IFE system box in a space-saving pancake design under the seat pan, results in additional legroom.

03. Clear space: the IFE box is located under the seat pan in a space-saving pancake design



RECARO IS SCIENTIFICALLY AND SYSTEMATICALLY ASSESSING THE ENVIRONMENTAL PERFORMANCE OF ITS SEATS THROUGHOUT THE LIFECYCLE



The CL3710 seat design also provides passengers with maximum comfort. Recaro's entire expertise in ergonomics has flowed into the CL3710. Its new, six-way adjustable headrest, for example, can be better adapted ergonomically to individual passengers, and can also be easily set to accommodate differing heights. A major step forward in terms of ergonomics and comfort is the extra neck support offered by the headrest. In combination with the enlarged adjustable ears, the headrest offers superior comfort to passengers, especially when relaxing or sleeping.

"We are proud that we have been able to integrate numerous innovations in the seat," Dr Hiller continues. The Recaro team is pleased that several of the solutions have been registered for patents. During the development of the CL3710, applications were made for 18 patents, with nine new inventions being directly integrated. The remainder will be utilised in further developments. Five existing patents have also been used in the seat. As well as protecting the technical functions of the seat, Recaro has gone one step further with the CL3710 in also copyrighting the visual look of a seat developed by Recaro's in-house design team.

PLANET FRIENDLY When designing the CL3710, the Recaro team carefully analysed every material, technology and manufacturing process to arrive at the lowest possible weight. The result is a per-passenger seat weight of less than 12kg – the lightest in its class.

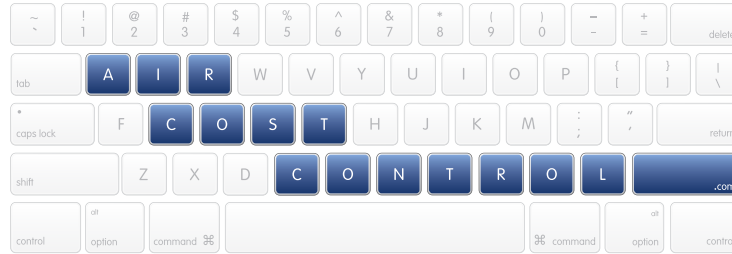
In addition to producing a range of lightweight seats, Recaro provides its customers with an assessment of the impact of these environmentally friendly solutions. Airlines are increasingly focusing on environmental and climate protection. Weight alone is not the only way to achieve a 'green cabin'. Environmental performance during production, and the product lifecycle of interior components, also play a decisive role.

Recaro is breaking new ground here: based on lifecycle assessment (LCA), the company is scientifically and systematically assessing the environmental performance of its seats throughout the entire product lifecycle. Each of the seat's parts is carefully evaluated in order to assess its overall environmental impact. The knowledge gained in this process can be used early in product development and when evaluating the product. The Recaro team can then select concepts that reduce both the amount of energy expended during production and the CO₂ emitted during the usage phase. In this way the seat's CO₂ footprint across its entire lifecycle can be improved.

The CL3710 is just the beginning – to be followed very soon by further innovative solutions from Recaro. "With the CL3710 we are announcing the start of a new Recaro product offensive. We are already working at full speed on innovations in line with our new development philosophy. We will be launching them at Aircraft Interiors Expo 2014 in Hamburg," Dr Hiller promises. ☒

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facevalues

Companies looking to streamline their operations might benefit from the attentions of the Value Stream Team



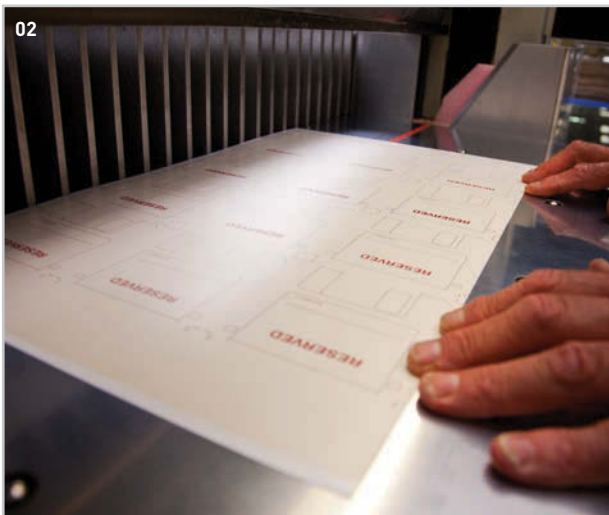
When Paul Michaels, director of GMN Aerospace, arrived at the office for the first day of the Value Stream Team event, he knew that his group had a busy week ahead. What Michaels didn't expect was the 20-gallon storage tub full of office supplies that the Value Stream Team Coach arrived with – hundreds of sticky notes, pens, pencils, and even multiple colours of string. Even more surprisingly, by the end of the week the storage tub was empty.

In May 2012, GMN Aerospace held a Value Stream Team event with The Boeing Company. GMN Aerospace provides the industry with interior and exterior markings, plastic components and exterior graphics. At the time, the GMN team had just won their third consecutive Boeing Supplier of the Year award, but were still eager to make improvements to their offering.

Boeing Value Stream Team events are one to two weeks long, and are focused on improving every aspect of aircraft production. At Boeing, they are made up of suppliers and Boeing employees for every commodity of the aircraft. The overall goal is to streamline manufacturing, starting with raw material suppliers, all the way to the delivery of the aircraft.



01. A GMN Aerospace employee stretching a custom screen
02. Shearing one of several hundred daily orders



PREPARING FOR SUCCESS To prepare for the week-long exercise, Michaels and production manager Jeff Root spent a month writing and refining a charter with the Boeing team, outlining the purpose and goals of the event. They also met with production managers and leads to pick individuals from all aspects of the business, including customer service and production, to be involved in the event.

To begin, the group walked through the entire production process and began building a current state map of production. The current state map spanned the length of GMN's largest conference room, covered with sticky

notes and string, outlining every step in the production line. After learning about waste found within the manufacturing process, the team identified it within GMN Aerospace's production line. Identifying those areas was eye-opening for most of the participants. People at every stage of the production line had a new understanding of what happened up and downstream. Redundancies and inefficiencies were uncovered. After recognising opportunities for improvement, the group worked to establish a future state map that would update processes and eliminate identified inadequacies.



THE GOAL IS TO STREAMLINE MANUFACTURING,
STARTING WITH RAW MATERIAL SUPPLIERS



03



03. A cabin electrical outlet subassembly for use in first class

GMN Aerospace has been utilising lean concepts and 6 Sigma for over a decade. Despite established practices, after mapping out the current process map and future value stream map, there were still areas for lean and Kaizen principles to be implemented further. After building the future state map, the team worked to prioritise tasks and develop a project plan to reach their ideal. The team developed a Kaizen newspaper of action items to eliminate areas of waste within the company's manufacturing process – essentially a roadmap to success. Collectively, the group came up with a lot of ideas but eventually narrowed

them down to 25 specific action items. To identify the best opportunities and options for improvement, the group asked the following: does it add value for our customers? Is it feasible? Does it reduce waste? And last, is it going to get us to our future state?

By the end of each day the team had opened up more and more. People involved on the actual production line were actively engaged, and their voices were fully heard. There were many laughs and animated discussions, but mostly a lot of 'a-ha!' moments. Sharing how one workstation's duties affected the next shed light on areas of waste. One workstation realised that making a

small adjustment in their process saved the following work station 30% of time per job. At the end of the week, the team was not only excited to implement the improvements they had developed, but had a vested interest in the programme's success.

The Value Stream Team event showed the GMN Aerospace group that there is no end to innovation. Despite the organisation's industry accolades and high ratings that same year, there was still more work to be done. In today's manufacturing world, there is an increasing need to reduce supply chain costs in every industry. For aerospace manufacturers, this not only



means pressuring their suppliers to cut costs, but also reducing their own supply base. Simply lowering prices is not enough. In order to stand out as a strategic supplier, companies must not only meet cost-down initiatives, but also be innovative, actively engage with their customers, maintain high quality and delivery ratings, and fully embrace lean manufacturing.

In the end, GMN Aerospace reorganised its entire manufacturing process, netted a cycle time reduction of 25%, and vastly improved throughput and quality ratings. Simple, yet significant, changes to standard practices and the organisation of the production line created new efficiencies and perfected processes. The Value Stream Team event was an invaluable team-building experience between every unit within GMN Aerospace. It was not only a first for a Boeing supplier, but also for GMN Aerospace. The Value Stream Team efforts set a benchmark for the entire organisation, and the best practices the team developed have been implemented across the company.

A LEAN APPROACH GMN Aerospace has been serving the industry for more than 50 years. The company's roots are in aerospace markers and placards, but over the years its capabilities and processes have expanded to better serve customers. For many years GMN Aerospace has been utilising lean manufacturing to better serve all of its customers with shorter lead times, higher quality and increased flexibility. In 2007 the organisation's quality system was certified to AS9100 standard, and its plastics group



THE COMPANY'S ROLE AS AN AEROSPACE SUPPLIER IS LINKED TO ITS RELATIONSHIP WITH CUSTOMERS



- 04. Two of the 85,000 unique GMN Aerospace-produced parts
- 05. Backlit lavatory informational panel

achieved the same standard in 2012. Shortly after, GMN Aerospace was added to the Boeing Qualified Processor List (QPL) for the injection moulding of thermoplastic parts. Today the company's aerospace offerings include exterior graphics, value-added assemblies, and interior plastic components, in addition to interior and exterior markings.

It has been a year and a half since the Value Stream Team event at GMN Aerospace, and the company and its customers are still benefitting from the efforts. Today, GMN Aerospace is nearly 85% complete with its plan, and only a few longer-term action items are left. The company currently has a 99.9% quality and 99.7% delivery rating with The Boeing Company. The team is continuing its efforts to innovate as it is

always looking for new opportunities to improve.

GMN Aerospace remains focused on dynamic change through customer collaborations – a practice it calls Revolutionary Customer Engagement. The Value Stream Team event is just the beginning for GMN Aerospace, as it remains focused on its goal to better serve customers – whether that means expanding its capabilities, providing faster lead times, increasing short flow processes or improving quality. The company avidly believes that its role as an aerospace supplier is linked to its relationship with customers. GMN Aerospace recognises that in order to succeed it must not only meet the expectations of customers, but continually strive to exceed them. ☒

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
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Italianmasters

Light weight and comfort don't have to be mutually exclusive, as a newly designed family of economy seats shows

 Passengers are increasingly fascinated by the experience of flight. A comfortable environment has become an essential component of the pleasure of the journey, and technological innovation and style are closely linked to customer satisfaction.

Italian seat manufacturer Aviointeriors blends both of these factors to address the needs of this ever-changing market. The balanced organisational improvements implemented to strengthen the company and create a climate of growing trust for the future have stimulated in-house creativity and increased the firm's dedication to the needs of passengers and the requirements of airlines.

With its new products, Aviointeriors intends to focus on passengers' demands, also taking into account some key market factors, such as increasing fuel prices.

The result of this approach is evident in two different seat models, which combine Italian style with state-of-the-art design. Aviointeriors' aim was to create a product that is economically efficient, comfortable for passengers and environmentally sustainable.

- 01. Aviointeriors collaborated with Lamborghini in creating the Leonardo seat
- 02. Use of composites has enabled extensive seatback sculpting for comfort

01



02





THE SEAT MODELS COMBINE
ITALIAN STYLE WITH STATE-
OF-THE-ART DESIGN



03



A SUCCESSFUL PRESENT With this aim in mind, Aviointeriors presented its new Columbus family of economy seats during Aircraft Interiors Expo 2013 in Hamburg.

The Columbus range stands out with an elegant design that reveals an innovative combination of light weight and modularity. All the seats in the family are equipped with an elastomeric web as body support on the backrest, which is a practical way to ensure comfort during flight. To allow optimal shin clearance down to a 28in pitch installation, the literature pocket has been moved upwards.

The Columbus family has many options to achieve maximum flexibility. The family comprises three basic models suitable for operational requirements from regional to long haul. The slimline design also affords extra legroom at the tightest 28in pitch.

Columbus One is the lightest model, at 8.5kg/pax, created in response to airlines' requests for a lighter but comfortable seat. This

model is designed to maximise fuel savings and is suitable for regional and low-cost carriers. The seat can be specified with a preset fixed backrest featuring a lightweight tray-table that folds directly on the backrest shell.

Moreover, the traditional bottom cushion is replaced by an ergonomic elastomeric web suspension, which offers full comfort for flights of up to three hours.

Columbus Two provides enhanced comfort for medium-range operations (three to four hours) at a minimum weight of 10.9kg/pax, featuring backrest recline, provision for audio controls in the armrest, and an innovative double-density lightweight bottom cushion.

Columbus Three is designed for long-haul applications and features a minimum weight of 14.4kg/pax, including cradle system movement, adjustable headrest and full provision for in-flight video entertainment.

During the development phase, the rigid anthropometric model, based on a

03. The Leonardo seatback can also accommodate an IFE display



single passenger posture for the definition of the main layout of the seat, was superseded. Instead, a system that takes into account the whole range of passenger movements, including moving in and out of the row, was successfully used. Clever engineering solutions mean the Columbus family is also simple to maintain.

The Columbus range has been developed around four concepts: comfort, simplicity, lightness and commonality.

The validity of the project, which swiftly became a certified reality (Boeing 737 family and, in the next few months, the A320 family too), was recognised by several airlines that have chosen Columbus seats for their aircraft.

“Our commitment to always choose practices that contribute towards environmental protection, our efforts to maximise efficiency and take advantage of the full potential of our aircraft, were integral to our choice of lighter seats for our fleet, which will be provided by Aviointeriors,” commented Dimitris Gerogiannis, CEO of Aegean Airlines, after the decision to retrofit the company’s A320 fleet with Columbus Two seats.

A STEP FORWARD As part of this commitment to innovation, Aviointeriors has introduced an evolutionary project. In collaboration with Lamborghini Engineering, whose knowledge of the aerospace sector through its Advanced Structures Composite Laboratory in Seattle makes it a perfect partner, a new model of seat, named Leonardo, has been created.



CLEVER ENGINEERING SOLUTIONS MEAN THE COLUMBUS FAMILY IS SIMPLE TO MAINTAIN



- 04. Columbus Three is the long-haul version, with provision for IFE
- 05. Columbus Three weighs in at 14.4kg/pax, including cradle system, adjustable headrest and IFE provision

According to Mario Schisa, CEO of Aviointeriors, the collaboration with Lamborghini indicates not only a moment of creative growth for Aviointeriors, but also the chance to work side by side with a company whose unique internal manufacturing process enables scale production of composite materials, which are made according to the exactness required by aircraft certification criteria.

Leonardo incorporates a range of evolutionary elements, from the raw materials to the shape of its components.

“Leonardo’s primary structure is made from aluminium, because the metal’s greater yield strength absorbs loads better than the rigid carbon

composites,” says Francesco Varriale, Aviointeriors’ technical director.

All the other components from the seat pan upwards are manufactured from carbon composites. The reduced number of seat components means greater comfort for long-range flights can also be achieved. Compared with the average figures of long-range economy seats currently flying, Leonardo allows a delta weight saving of about 3kg/pax.

Fuel savings due to lower weight, enhanced comfort, exclusive design and technology fully validate the soundness of this innovative programme, which is expected to be pre-certified by the end of the year, to join Columbus. ☒

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truecolours

The latest LED lighting systems bring vitality to the colours and designs of aircraft interiors, as well as other elements such as inflight catering

- 01. A single-bar HelioJetTCS, which can produce many colours including red...
- 02. Purple...
- 03. And green



Replacing fluorescent tubes with LED lighting seems to be a widespread development in modern cabin lighting. However, there are challenges when aiming for a state-of-the-art LED system. Using HelioJet technology, Schott and Lufthansa Technik have found a way to create a brighter future in aircraft interiors.

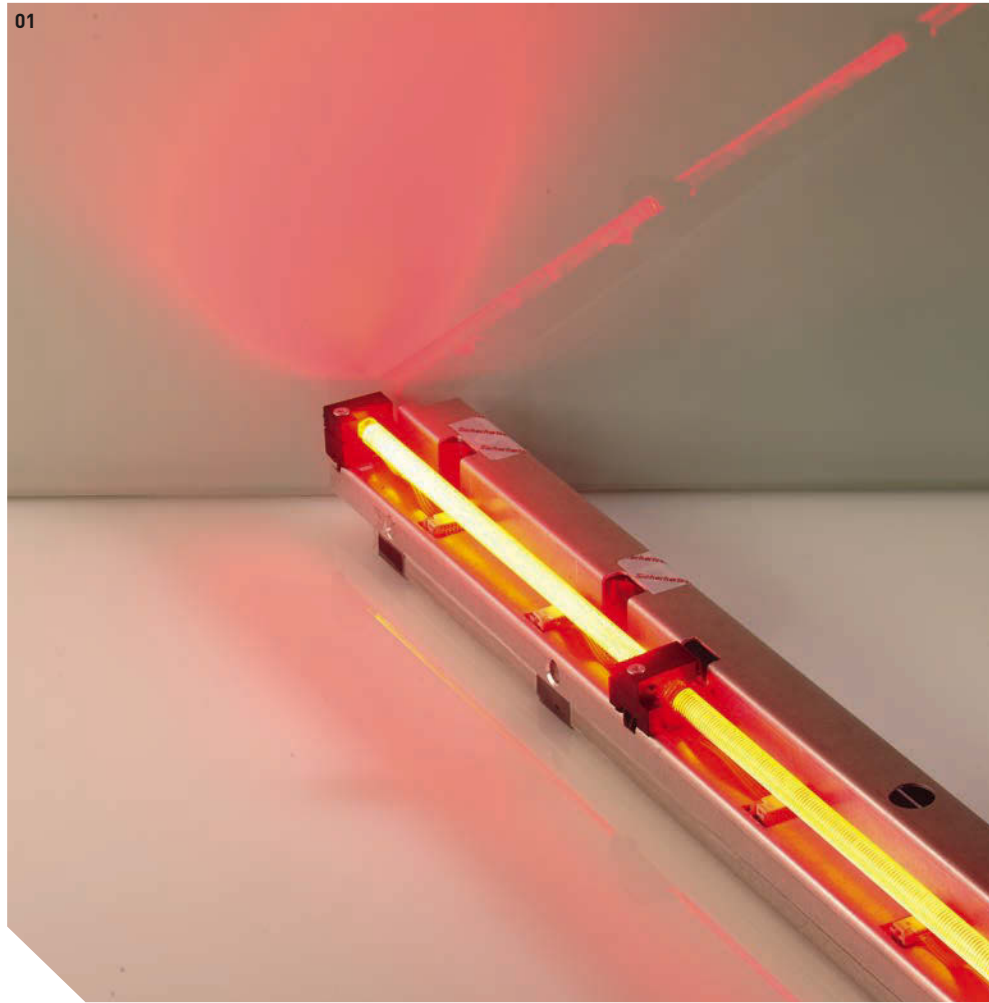
Lighting has become an essential factor in cabin interior designs. Not only does the quality of light decisively influence passenger comfort, it also enables airlines to enhance their onboard brand recognition. A recent study on behalf of Schott Aviation reveals that 89% of the representatives surveyed, who came from airlines, completion centres, lighting manufacturers and design offices, stated that lighting is “really important” or “important” for cabin design.

Since lighting has only recently begun to play a major role in retrofit and linefit projects, the importance of light is likely to increase. The cabin lighting market has been estimated at approximately US\$1 billion and is growing. As the study for Schott Aviation reveals, LED technology is expected to remain the industry standard for aircraft lighting for at least the next five to 10 years. Compared with the old technology of fluorescent tubes, including ballast units, LEDs are widely recognised for their high mean time between failures and flexible use.

“About four years ago, when we started to develop a unique LED cabin interior lighting system with our partner Lufthansa Technik, we addressed three general dimensions: design, performance and efficiency,” says Dr Armin Plichta, director at Schott Aviation. “Looking back, consistent performance over time is the biggest challenge.”

The intensity and colour temperature of LEDs changes with use. Some change faster than others and there is no predictable pattern. This

01



phenomenon is inherent to LED technology and cannot be avoided.

“Every LED cabin system has to be evaluated by how and to what extent it manages the problem of ageing LEDs,” explains Plichta.

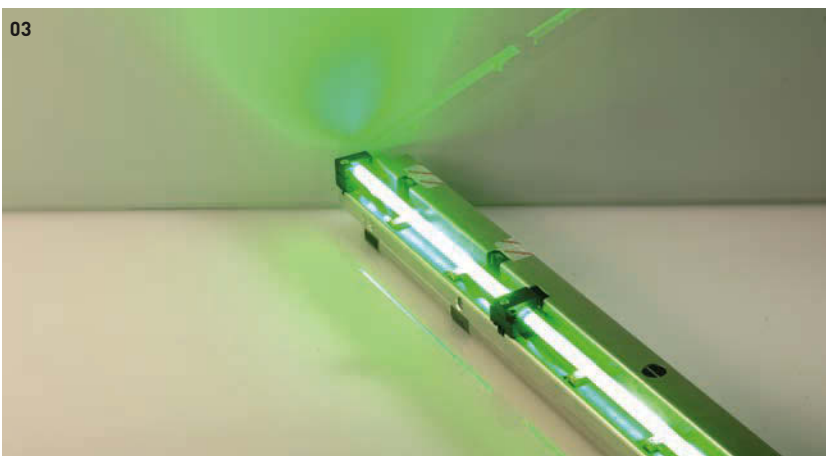
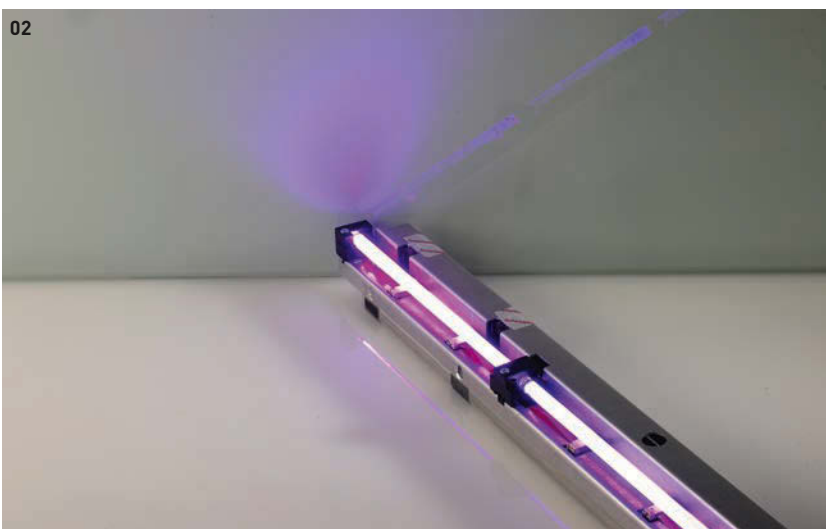
Shifts in light intensity and changes in colour temperature create obvious undesirable effects. ‘Light dots’ are a well-known defect when using LED light strips. When single LEDs lose their intensity, homogeneous light distribution is no longer possible. This distortion becomes even more dramatic with RGB LEDs for coloured light.

“We know from airlines that shifts in intensity and colour have become

the crucial point when considering LED lighting. Maybe the ageing phenomenon was somewhat underestimated in this context,” underlines Andrew Muirhead, director of the innovation business unit at Lufthansa Technik.

The study revealed that several airlines would like to invest in LED cabin lighting, but still think that there is no suitable LED system currently available for aviation.

HelioJet technology overcomes the phenomenon of ageing LEDs. Rather than placing numerous LEDs in a line, it works with only two LEDs per lighting element, which feed light from



the two ends into an optical light converter. Based on fibre-optic principles, the converter mixes the light and distributes it evenly over the entire distance of the light element. This enables HelioJet to provide unmatched homogeneous light – not only when new LEDs are installed, but continuously over time. The light mix in the converter overcomes the problem of ageing LEDs by reducing it to an indiscernible effect.

“If you have 10 LEDs that are not managed in a row on a strip, every shift in intensity and colour becomes obvious,” says Muirhead. “That is not the case with HelioJet technology.”

HelioJet also enables controlled light output by accurately adjusting the light and aperture angle. The light is no longer emitted in every direction, providing new possibilities for precise light design solutions.

BRIGHTNESS ABOVE THE CLOUDS

Since the European aviation authority EASA issued a supplemental type certificate (STC) for the Airbus A320 family, HelioJet technology has been lighting the cabin in an Airbus A319.

“People tell us after seeing the modified A319 that HelioJet adds a new dimension to interior lighting quality,” reveals Plichta. And indeed,

“

COMPARED WITH FLUORESCENT TUBES, HELIOJET THROWS A DIFFERENT LIGHT INTO THE CABIN ”

compared with the fluorescent tubes that have previously lit the interiors of the A319, HelioJet throws a different light into the cabin.

04. A schematic of the HelioJet technology in white

“Now green salad looks green because it, and all materials including the lenses in front of the lights, no longer age and turn yellow,” explains Plichta. So it is no real surprise that all interview partners from airlines who participated in the Schott Aviation study claimed that cabin lighting is “really important” with respect to passenger comfort. The group of designers who were asked the same question answered similarly.

However, HelioJet not only makes passengers and designers happy, but also addresses business administration and reduces required maintenance.





LIGHTING WILL INCREASINGLY BECOME AN ESSENTIAL TOOL TO CONTRIBUTE TO BRAND RECOGNITION

HelioJet requires only about one-fifth as many light diodes as other LED strip solutions.

“From a business perspective that implies greater reliability, which is expressed as a higher mean time between failures. Additionally, one can exchange all LEDs and even repair the HelioJet on the spot with the possibility of reusing existing components when the aircraft is on the ground. That saves time and waste,” Muirhead explains.

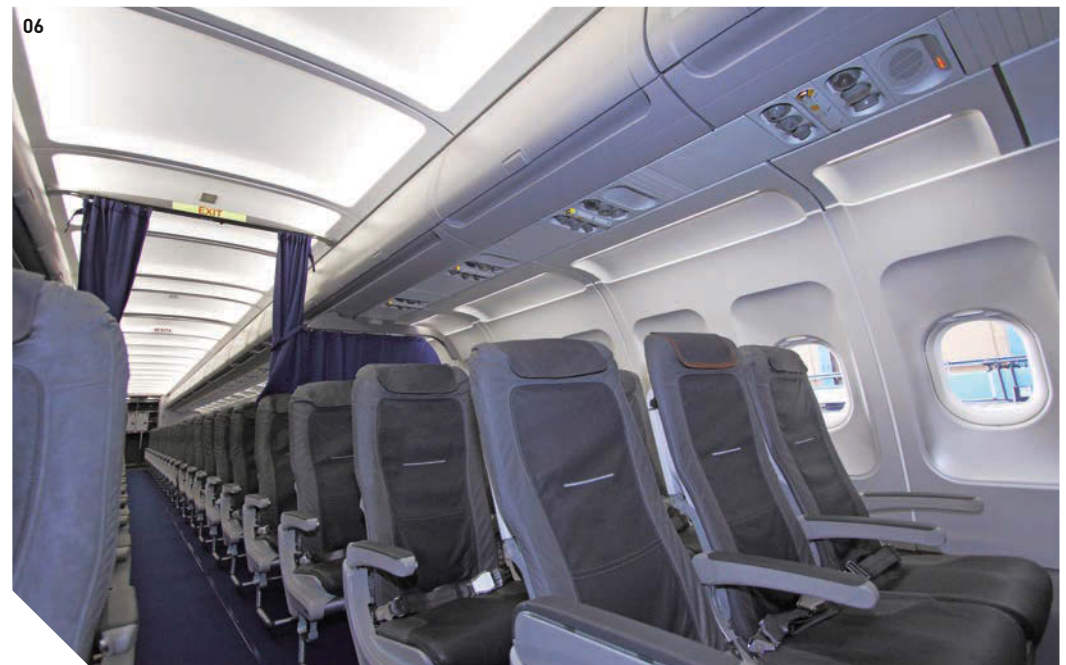
COLOURS TO COME HelioJet was presented to the public for the first time at the Aircraft Interiors Expo in Hamburg in 2011. With the introduction of this technology for white cabin light, the question of using it for coloured light arose. The answer is HelioJetTCS – the red, green, blue, white (RGB-W) version with True Colour Stabilisation (TCS).

“With HelioJetTCS, we made a huge move forward. It is the HelioJet for advanced use,” Plichta says. HelioJetTCS gives 16 million colour shades – offering almost unlimited possibilities for mood lighting and corporate colour themes. Light is a very effective way to influence passenger perception and mood.

“Lighting will increasingly become an essential tool – not only to create an appealing atmosphere, but also to contribute to brand recognition. The first impression that passengers receive when they enter an aircraft is a huge opportunity for the airline to build its brand,” states Plichta.

Some airlines, such as Virgin Atlantic, already employ coloured light to deliver a distinctive boarding experience.

HelioJetTCS also works with an optical light converter. At each end,



four LEDs feed in light, which is mixed in the optical light converter. Since colour LEDs are much more heterogeneous than different shades of white, HelioJetTCS also includes sensor-based controller technology, which ensures that every LED installed in the system is perfectly in tune with the specified setup and accurately produces the desired colour temperature.

The controlling system does more than manage the LEDs in one HelioJetTCS unit; it also controls all HelioJetTCS in the cabin. In this case, the light is subjected to online control to make sure it retains the desired set point values. Any colour play can be controlled using the ‘nice HD’ cabin

- 05. A schematic of HelioJetTCS
- 06. An Airbus A319 cabin with HelioJetTCS lighting
- 07. An Airbus A319 cabin with fluorescent lighting



management system from Lufthansa Technik, for example.

“We really offer an all-in-one-solution, for which there is nothing comparable in the market. The optical light converter and the sensor technology of HelioJetTCS are unique,” concludes Muirhead. ☒

Contact: aviation.info@schott.com
 Web: www.heliojet.aero



HelioJet cabin lighting at work! Now with STC approval for the A320 family

There is no second chance to make a good first impression. This also holds true when passengers board an airplane. With HelioJet, the innovative cabin lighting system from Lufthansa Technik and SCHOTT, passengers are impressed from the very first moment. HelioJet technology redefines LED lighting. Two LEDs feed light from both ends into an optical light converter, which mixes the light according to fiber optic principles. The output is unmatched homogeneous light; no visible color shifts over time and no "dead spots." HelioJet is easy to install, and maintenance costs are low. HelioJet is already flying and has EASA STC approval for the Airbus A320 family.

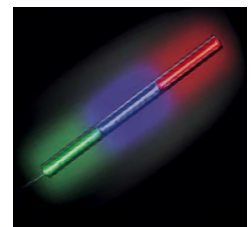
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Same aircraft interior before HelioJet has been installed



HelioJet technology with EASA STC for even light distribution



HelioJet^{TCS} with True Color Stabilization. Coming soon!




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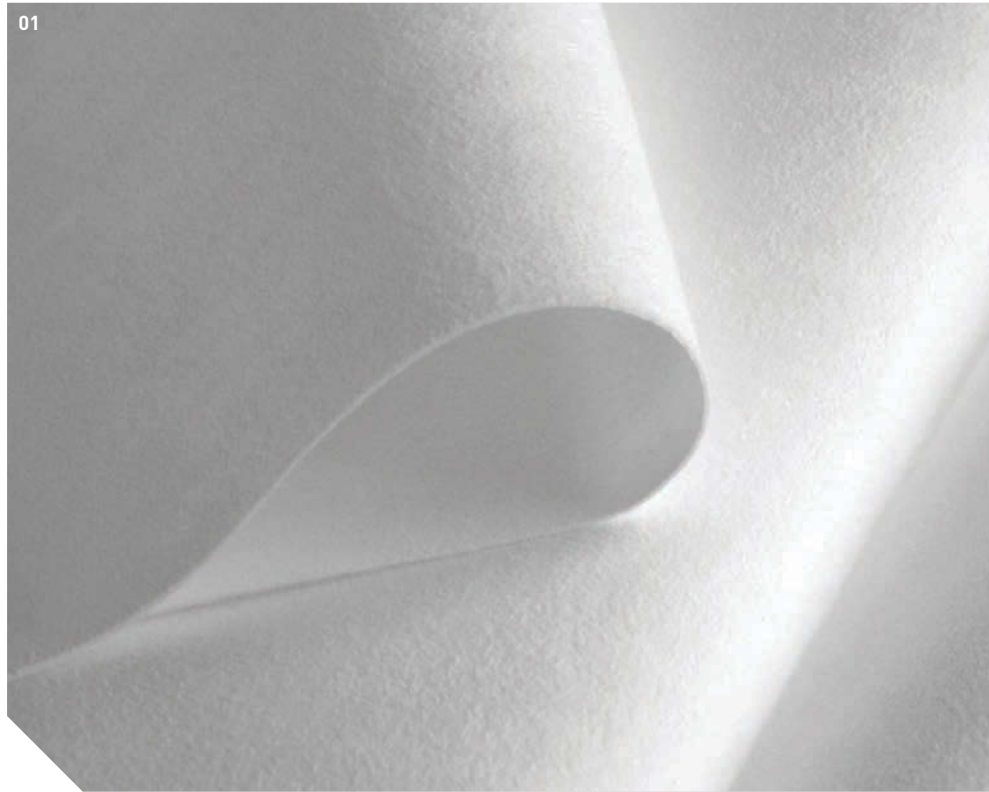
Tapis creates products that are designed to offer all the advantages of leather without any of its disadvantages

 Since its inception in 1977 Tapis Corporation has been a trusted supplier of fabrics to the aviation industry. The company's unique custom capabilities offer aircraft interior designers a tremendous opportunity to create an original cabin design while fulfilling their design vision.

Tapis has a brand-new custom Ultraleather specification that has excellent flammability characteristics and can be formulated to pass Heat Release and Smoke Density: FAR25.853, Appendix F, Part IV and Part V, as well as 12 and 60 Second Vertical Flammability: FAR25.853, Appendix F, Part I (ii) and (i). This reliable, proven Ultraleather product gives customers the flexibility to use it with various composite build-ups and move through the certification process smoothly.

This new custom product is specifically designed for vertical applications throughout commercial aviation, and is manufactured using new technology with low heat release and superior FR properties. It is available in a number of luxurious custom grains and ensures compliance in various seat build-ups without compromising durability.

01. Tapis also offers an Ultrasuede in a range of colours
02. Ultraleather covers the bar in the latest Virgin Atlantic Upper Class cabins



CUSTOMISATION Customisation is nothing new at Tapis. For many years the company has created custom grains, colours, finishes and technical specifications, including ink-resistant and anti-microbial properties with Ultraleather products for leading airlines around the world, including Singapore Airlines, Etihad Airways, Swiss Air, Kingfisher Airlines and JAL. On each occasion, Tapis created a customised programme to meet airlines' precise needs for texture and colour. For example, the Promessa fabric has many different grains that can be customised for an airline's seating programme.

Different applications require different grains, and Tapis' ability to customise allows for a better passenger experience. The company can manufacture the product around the application for which it is being used. For example, aircraft seating requires

an extremely durable, yet soft and comfortable fabric. And although traditional leather has long been a popular choice for seating, Tapis' Ultraleather brand of products offers a more luxurious feel, look and style with enhanced performance features. For over a decade, Ultraleather has been successfully used in high-wear seating applications on Embraer aircraft worldwide for Express Jet fleets and many others.

Since 1966, Ultraleather has been produced using only custom-engineered, premium-grade polycarbonate resins utilising proprietary Takumi Technology, which promotes thermal comfort and a neutral body temperature, no matter what the climate. Each product undergoes rigorous hydrolysis testing (per test methods ISO 1419 Method C and ASTM D 3690-02 se. 6.11), ensuring that every offering on the





ULTRALEATHER IS LESS THAN HALF THE
WEIGHT OF TRADITIONAL LEATHERS



market meets premium standards for durability, as well as heat/moisture and UV resistance. Lesser-quality leather alternatives and resin composition, such as polyether and polyester, have a much shorter lifespan than Ultraleather.

Ultraleather is extremely lightweight – less than half the weight of traditional leathers. As a result of its substantially lighter weight, Ultraleather reduces fuel consumption, driving costs down and reducing the overall weight of the seat and cabin. There is also less shrinkage than with traditional leathers, offering 100% yield. This translates into 100% usable fabric. And independent testing from the University of Cincinnati shows that Ultraleather meets or exceeds all industry standard testing criteria used for the most durable leathers on the market today.

From an environmental perspective, Ultraleather recognises the need to

protect human health globally without compromising fire safety. It is part of a new generation of technologically advanced, polyurethane-based products that are recognised for the ways they protect the environment: the manufacturing process used to create Ultraleather minimises effluent, reduces emissions and consumes less energy.

Not only is Ultraleather durable and soft, it's also easy to care for. Most stains can be removed with soap and water, and it can even be disinfected using a simple 5:1 water-to-bleach solution, without affecting the colour or the grain. Additionally, no toxic aftercare is needed to keep Ultraleather looking its best, which eliminates the need for harmful

cleaning solutions and improves overall air quality in the cabin.


The aesthetics and durability of Ultraleather products make them a brilliant alternative to traditional leather, with superior quality. To further extend the lifespan of Ultraleather, Tapis has partnered with The Leather Institute to provide customers with the resources to keep clean and repair Ultraleather. Through this partnership, Tapis now offers an effective biodegradable cleaner that works well for the general maintenance of Ultraleather. In addition, The Leather Institute offers a complete line of restoration services, including cleaning products, conditioning, touch-ups, colour restoration, repair and training. ☒

03. Simple maintenance requirements help ensure that Ultraleather keeps looking good in service

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original approach

With several 'firsts' already under its belt, Flydubai has taken an innovative approach to its business seating

 Flydubai, the fast-growing, Dubai-based airline, has made it a priority to do things differently. By challenging the norm it has moved beyond the conventional definition of a low-cost carrier (LCC), offering a special passenger experience with added-value services at affordable prices. In just a few years the airline has become profitable, grown its network to over 65 destinations, expanded its fleet of aircraft, and carried over 10.4 million passengers. Based on its understanding of market needs and passenger preferences, Flydubai recently introduced its latest offering: business-class services.

This is not the first time the airline has pioneered a new concept: the airline was the launch customer for the Boeing Sky Interior, and set a new benchmark for IFE as the launch customer for the Fiber-To-The-Screen (FTTS) system from Lumexis in 2010. Flydubai is continuing to offer an unprecedented increase in video and music content following the launch of an enhanced offering in March. The carrier now shows more Hollywood movies than any other airline.

Commenting on the business-class service, Dan Kerrison, vice president of inflight products at Flydubai, says, "We have always been able to react quickly, in order to make the most of

01. The 12 Geven Comoda seats are configured 2-2 at a 42in pitch

02. The 21in-wide seat weighs 21kg per pax place



operational and commercial opportunities when they present themselves. When it became clear to us that our customers wanted the option of a premium inflight experience, our goal was to answer the call as quickly as possible, without compromising the quality of the product."

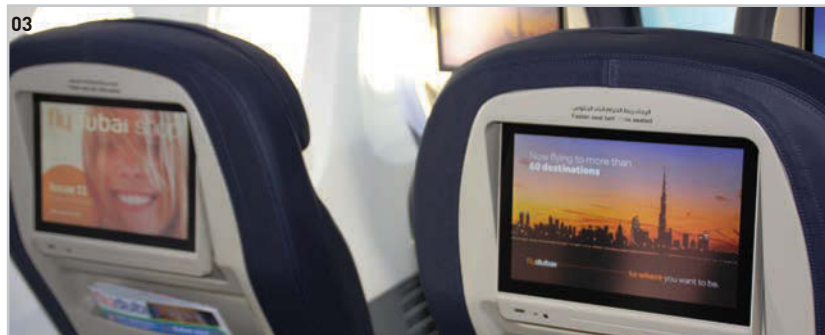
Through this process the airline quickly learned that the majority of seat manufacturers did not cater for the development of business seating for narrow-body aircraft. Flydubai saw a unique opportunity to work with a leading aircraft seat designer that would conceptualise and manufacture

a seat to meet market demand for a premium inflight experience.

"When searching for a business-class seat to complement the existing inflight product, we were determined that we did not want a product that was 'off-the shelf'; it simply wasn't in our nature to install seats that conformed to what was readily available in the market, and we knew we could push the boundaries and be more creative," adds Kerrison. "We initially issued a request for proposal (RFP) to most of the well-known aircraft seat manufacturers. Responses were evaluated on the basis of five key

“

WE KNEW WE HAD THE CAPABILITY
TO CREATE A NEW STANDARD ”



Flydubai customers,” continues Kerrison. “A strategic component to the success of the project was due to Geven’s commitment to secure certification from regulators for the new seat design, a task which would have been much easier with a legacy seat. Ultimately the programme was an overwhelming success.”

From the Initial Technical Coordination Meeting (ITCM) to delivery of the first shipset, the Flydubai and Geven teams worked together to develop what was initially just a concept, into a certified business-class seat. The overall project time schedule was only 11 months, and Timco Aerosystems, appointed as integrator, hosted a Global ITCM just four months before the first aircraft installation. This ambitious schedule was met despite the complexity of working with three regulatory agencies (EASA, FAA and the UAE’s GCAA). In this context the team at Geven demonstrated commitment to delivering a new generation of narrow-body business seats.

Lelio Cirillo, head of programme management at Geven, states, “When we responded to the RFP, we were determined to be associated with such an innovative and successful brand. We also knew that we had the capability to design a seat that would ultimately

create a new standard in flight experience. The Comoda seat, which we designed and manufactured exclusively for Flydubai, was an exciting project to work on.”

Rodolfo Baldascino, marketing and sales manager at Geven, adds, “As with any brand-new seating project, the criticalities we had to face were mainly to do with managing a complex supply chain, especially on aesthetic and cosmetic items; ensuring the highest quality of finishes; meeting the target weight while making a seat to the full satisfaction of Flydubai; performing all tests successfully in a very limited timeframe; and carrying out the certification of the seat and cabin layout in accordance with the three regulatory aviation agencies involved.”

All this has been achieved due to a very close cooperation between the Flydubai and Geven teams. “Reciprocal and endless trust and confidence in technical and professional skill as demonstrated by both parties, have created the right arena to achieve the overall programme goals and meet the very strict timing while delivering a product that fully supports Flydubai in repositioning itself in the Middle East airlines arena, and boasting a new and sustainable competitive advantage towards local and international competitors,” adds Baldascino. ☒

03. 12.1in Lumexis displays have been integrated into the Flydubai seat design

considerations: style, cost, weight, customisation and schedule. Ultimately, Geven presented the most stylish and lightest seat concept, and demonstrated a genuine desire to be selected for the programme. Their people were also able to see the potential of developing such a product for this segment, as more and more short- to medium-haul airlines recognise the need to add a premium offering into their cabins.

“By designing modern, stylish seats specifically for narrow-body airframes, Geven was able to maximise the utilisation of the cabin space, resulting in greater living space and comfort for

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cleansheet

When specifying thermoplastic alloy sheet products for an aircraft interior project, there are some crucial aspects to consider

01. Unlimited colours, textures and patterns – including metallics, brushed aluminium, carbon weave and honeycomb – expand design possibilities



At a minimum, sheet for the thermoforming and fabricating of aircraft interior components must carry FAA fire, smoke and heat release ratings, and in some cases also comply with recent toxicity standards established by Boeing and Airbus. Since allowable sheet products must be certified to these standards, the specifier's search for an ideal sheet product should begin, not end, with fire-related certifications, and should focus on significant differences in functional attributes, aesthetic qualities and supplier policies to pinpoint the high-performance sheet product that best satisfies individual requirements.

High-performance thermoplastic alloy sheet products that qualify for aircraft interior applications must be certified as meeting stringent FAA

standards for flammability, heat release and smoke generation, including: FAR 25.853 A1 F, Part IV-6565/5050; FAR 25.853 (d); FAR 25.853 A1(i); and FAR 25.853 A1.

It is therefore vital that the sheet purchased carries the above certifications. It is important to note, however, that the thermoplastic formulations developed to meet these standards typically incur significant reductions in physical property values, particularly impact resistance. Since the properties of competing fire-rated sheet can vary widely, it is incumbent on the specifier to identify those sheet products that offer the most desirable properties for any given fire rating and/or category of product.

Be certain to specify a sheet product that offers the greatest physical property values – especially impact resistance – at the same cost as lower-performing sheets, or better, sheet products offering superior physical properties as well as the lowest cost.

By using a sheet product with superior impact resistance, it is possible to reduce in-service part failure, and to reduce sheet thickness (and associated weight and cost) without decreasing the impact strength of the part.

Similarly, superior tensile strength, flexural strength and flexural modulus improve durability in the field as well as in the shop, with routing, brake forming, drilling, mechanical fastening and other processes performed with reduced splitting, cracking and associated waste.

The aircraft-rated sheet products of major manufacturers can easily be compared in terms of Izod impact resistance, specific gravity, tensile strength, flexural modulus, Rockwell hardness, heat deflection, heat release,

NBS Smoke and thermal expansion, etc by comparing specifications of individual grades online.

Also critically important is sheet quality, which should never be assumed. The brand of sheet should be known to be free of pits and inclusions, both of which can be researched through other specifiers or through sheet suppliers themselves.

Designers yearn for the widest possible selection of colours, metallics, wood grains, patterns and textures – the tools they need to create interior environments that owners and passengers will prefer over the interiors of competing aircraft.

It is therefore important to try and maximise the aesthetic options offered by the sheet manufacturer being considered. Factors to consider include: unlimited range of solid colours, translucent colours, clear sheet, custom patterns, thicknesses from 0.76-6.0mm, standard and custom surface textures, scratch-resistant surfaces, scratch-resistant metallic colours, and low, medium and high-gloss surface textures.

Because aircraft interior projects generally start small and then grow, the sheet supplier selected should also offer low minimums on all variants of its sheet products, enabling the project to be initiated without cost penalties or long deliveries.

Flame and smoke requirements, which were once the determining factors in sheet specification for thermoformed aircraft interior components, are now satisfied by a wide range of certified sheet products. As a result, specifiers can shift their attention to differences in the physical properties, cost and appearance of sheet products, and in the manufacturers that offer them. ☒



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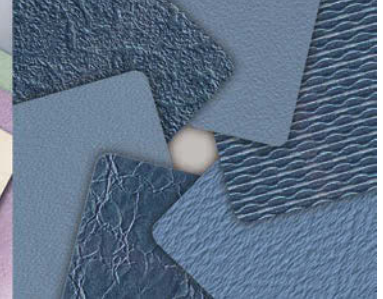
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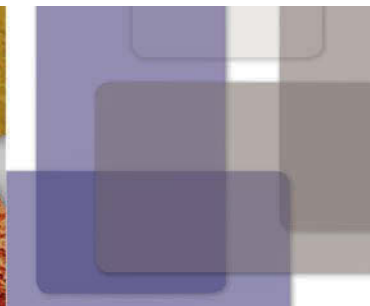
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
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takingcontrol

An integrated cabin control system can improve the flying experience for crew and passengers alike



01. By linking with the LED systems, IntelliCabin can enable striking lighting programmes

 BAE Systems is a global defence, aerospace, and security company with approximately 93,000 employees worldwide. The company delivers a full range of products and services for air, land and naval forces, as well as advanced electronics, security, information technology solutions, and customer support and services.

BAE Systems' Commercial Aircraft Solutions division has a history of excellence and innovation in manufacturing high-integrity avionics, flight and engines controls, and a broad range of cabin and cockpit electronics. More than 1,000 Boeing 777 aircraft are flying today equipped with BAE cabin systems, with a total installed base of 12,000 aircraft worldwide. In addition, more than 600 in-service B737NGs are outfitted with Boeing Sky Interiors enabled by BAE Systems' attendant control panel.

BAE Systems' newest development product for commercial cabin systems is IntelliCabin, a highly integrated system that provides a unique flying experience for passengers and reduces crew workload. IntelliCabin integrates seamlessly with existing cabin systems, providing dynamic LED lighting, in-seat power for all passengers, simplified cabin functions for crew members, and built-in monitoring capabilities to help minimise aircraft turnaround time.

IntelliCabin is a cabin system with the passenger in mind. It integrates all functions to help craft a pleasant passenger environment. The system eliminates the need for bulky power boxes under seats, which can restrict legroom or space for luggage; provides power solutions for all seat classes; controls dimmable windows, cabin temperature and mood lighting; and increases crew availability to passengers by centralising and simplifying control through mobile devices.

IntelliCabin works with BAE Systems' Attendant Control Panel, and is expandable to operate via the flight crews' PEDs, enabling attendants to spend more time with passengers. The system is leaner, yet more robust than existing cabin control systems,

reducing the number of components that an airline needs to install, and can reduce in-seat power requirements by 50% compared with existing systems. It also integrates with other cabin subsystems, such as tablet-based IFE systems on wide-body aircraft. In addition, its pay-for-power capabilities give the option of added revenue if applied to economy-class seats.

"BAE Systems prides itself on its history of excellence and innovation in high-integrity avionics and controls," says Dr Ehtisham Siddiqui, vice president and general manager of Commercial Aircraft Solutions at BAE Systems. "With IntelliCabin, we have set a new bar for in-seat power systems in the industry."

BAE Systems designed IntelliCabin to appeal to airlines, passengers and crew alike, with the goal of providing the ultimate flying experience, with special attention paid to safety, efficiency, comfort and service. The system, currently in development at BAE Systems' facility in New York, is available now; its in-seat power system will be available at the end of 2014. ☒



THE SYSTEM IS LEANER, YET MORE ROBUST THAN EXISTING CABIN CONTROL SYSTEMS



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THINGS ARE LOOKING UP

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
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BAE SYSTEMS

stayconnected

As satcom systems and the connected cabin grow in importance, CarlisleIT is striving to ensure the best connections

- 01. Antenna doublers are available for small or large installations
- 02. Coax cables can help ensure low PIM performance

 For more than 70 years, Carlisle Interconnect Technologies (CarlisleIT) has been one of the world's leading designers and manufacturers of interconnect solutions for the aerospace industry. The company's focus is on next-generation systems such as satellite communication technologies, better known as satcom. Here, CarlisleIT's product managers Jeff Behlendorf and Avery Schiefelbein explain the company's position in this space, and what products and services are available for this rapidly growing market.

WHAT PRODUCTS DOES THE COMPANY OFFER THE SATCOM MARKET? We provide a very broad range of support, including turnkey packages for airlines, satcom equipment manufacturers, MROs and airframers. CarlisleIT's product offerings range from complete system kits to high-performance cables, connectors, contacts, cable assemblies and structural elements. We also offer system installation design and certification services to integrate SATCOM and other avionics systems for retrofit and line-fit applications. Our engineering staff is available for on-site installation support, certification activities, and coordination with local authorities.

HOW DO THE PRODUCTS BENEFIT THE SATCOM/AEROSPACE MARKET? CarlisleIT has a long-standing reputation for products that are a balance of high performance and innovative design. Our vertical integration and turnkey solutions minimise the amount of time and effort our customers devote to logistics and ultimately get the aircraft flying sooner, saving everyone money.

We design our products for the life of the aircraft. All of our products are



designed around the equipment and system requirements, the aircraft, the airline and the safety of the passengers. We understand the requirements and concerns of the airlines and certification authorities, especially with a system such as satcom, where large antenna installations can be complex, and a low-maintenance design is critical to a project's success.

HOW HAS THE COMPANY HELPED SOLVE AN IT PROBLEM? Low Passive Intermodulation (PIM) is a critical feature of modern multichannel satcom systems to prevent signal mixing. CarlisleIT was approached by an aviation equipment supplier to develop a reliable series of coax cable assemblies to assure low PIM performance for their system on a new aircraft platform. We eliminated non-ferrous metals that can cause PIM and established a robust assembly process with extremely tight tolerances to

assure the highest quality terminations possible. The end products are cable assemblies that are truly low PIM and ideal for Ku/Ka band satcom connections between the antenna and the amplifier. We test every low PIM cable assembly before it leaves the factory. This ensures the quality and performance of the low PIM product and reduces any chance of delays and latent failure issues caused by terminations done at the aircraft installation site.

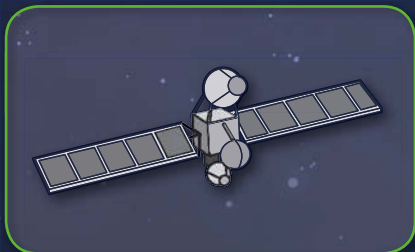
WHAT IS THE NEXT BIG TREND IN THE SATCOM MARKET? The industry is rapidly moving towards higher bandwidth to support better connectivity systems. For example, the Inmarsat Global Xpress satellites will dramatically increase speed and capacity, offering speeds up to 700Kbps to users anywhere on the planet. These new Ka band satellites require sophisticated directional antennas and that means big installations on aircraft fuselages. It also means a whole new generation of upgrades to the passenger cabin. More wi-fi, better video in the seats, faster data and seamless connections to the ground are all coming quickly to the passenger experience. CarlisleIT products and services touch every aspect of this trend towards a more connected cabin and we look forward to helping all of our current and future customers be successful in this market. With more than 120 engineers and test personnel in-house as well as manufacturing facilities worldwide, CarlisleIT has the expertise and equipment to support the latest developments and we will continue to innovate and support our customers in this rapidly growing industry. ☒



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CARLISLE
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comfortable position

EADS Sogerma looks back over a busy and productive 2013, and considers its mid-term strategy

- 01. The widebody premium economy version of Celeste
- 02. Over 6,000 units of the ultra-luxurious Solstys model have been sold to date

2013 has been a year of growing consolidation for EADS Sogerma. In April the company opened its new administration building and an extension to its production facilities, adding 7,000m² of production space, which has allowed proper definition of the Equinox 3D and 2D production areas, and a dedicated production line for a confidential programme. All of this is in addition to the existing six lines of Solstys production, one more line dedicated to first-class products, and another two that still support the Evolys product.

At Aircraft Interiors Expo 2013 in Hamburg, EADS Sogerma launched Celeste, its new widebody premium economy and narrowbody business-class product. The premium economy seat is pitched between 38 and 40in, and the business-class product between 40 and 45in. The product features a unique cradle position for relaxing, offering both classes of seat great comfort in all positions during flight.

The seat is offered with either a single electrical actuator or a 'G' mechanical release whereby the passenger uses his or her body weight as the drive towards the relaxed position. To date the product has been accepted by Airbus for inclusion into the A350 XWB ACS, and EADS Sogerma is in discussions with both of the major OEMs and airline customers for use in narrowbody applications.

The company is also working on a third generation of the award-winning Solstys product, further enhancing the levels of comfort and luxury on this successful seat, which to date has sold over 6,000 seats and growing.

MID-TERM STRATEGY EADS Sogerma will continue marketing its brand of premium first- and business-class aircraft seats, and now its premium economy seat. The company will also expand and grow its global market position in the premium seating segment, develop and create new business-class products to support its global customer base, and expand and develop its super first class market share.

EADS Sogerma also intends to maintain its punctual delivery performance to airlines and OEMs, which currently stands at 100% on time for the seventh year for the OEM and retrofit markets.



01

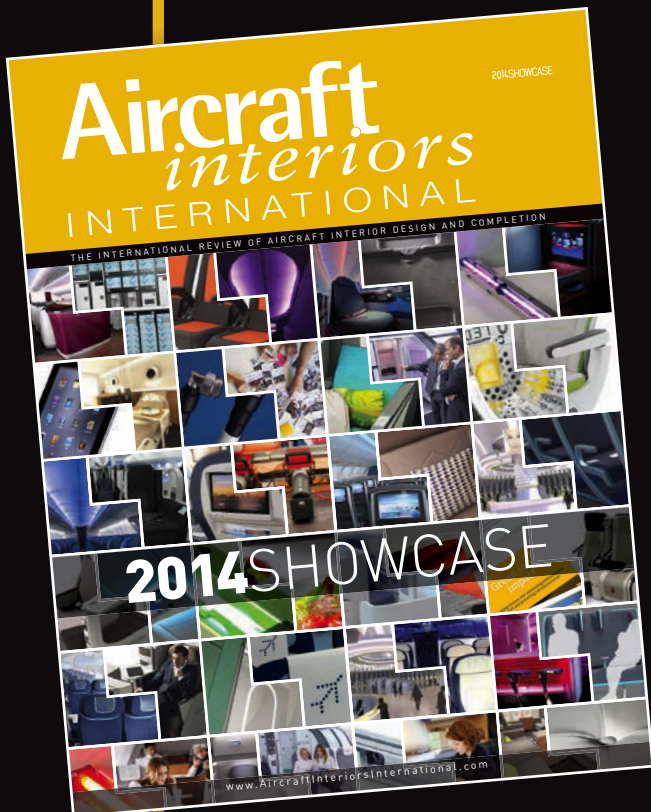
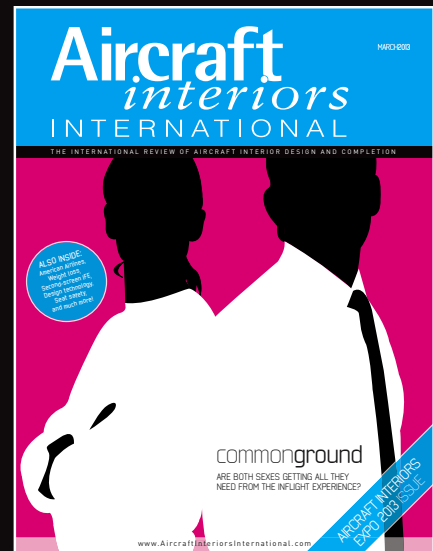
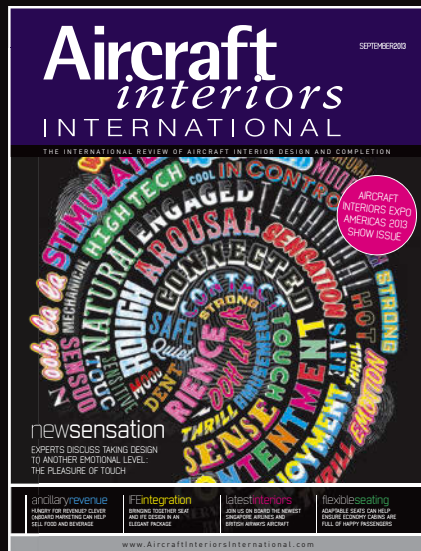
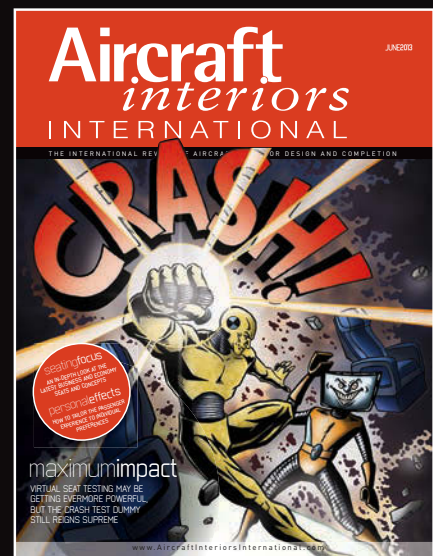
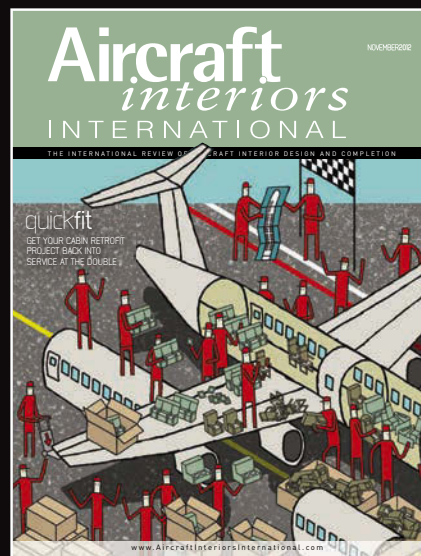
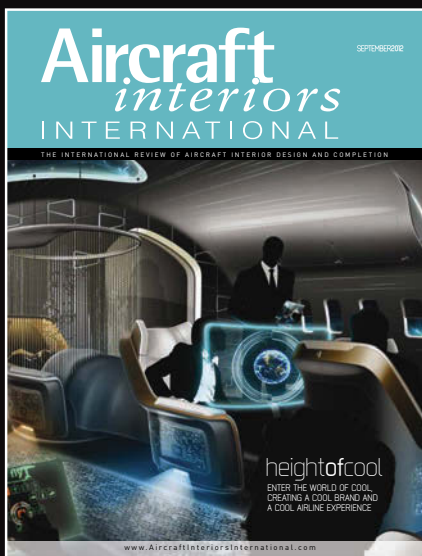
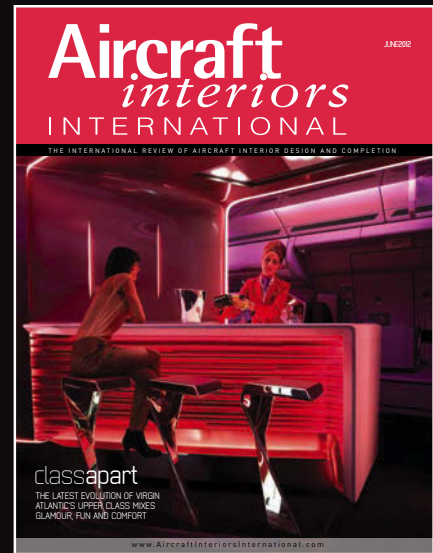
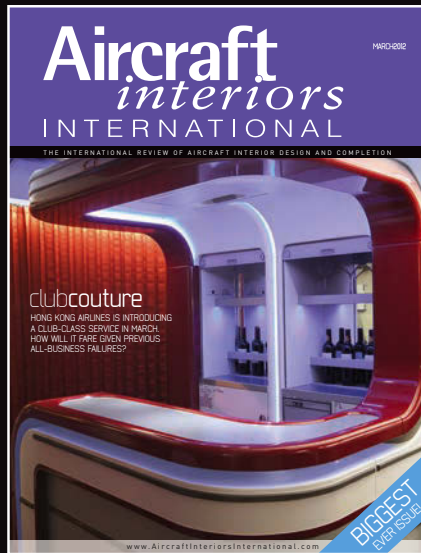
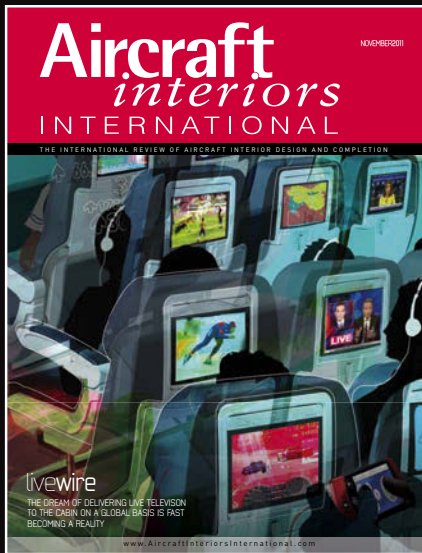
The company will continue to create design innovations and develop products within the boundaries of ISO 14001, with regard to their impact on the environment, and will launch, build and create sustainable support solutions for customers.

Didier Guinot, SVP of EADS Sogerma Cabin Interiors, comments, "Our team has worked extremely hard over the past 24 months to meet and exceed the requirements of our customer base and the expectations of EADS Sogerma management. Driving continued growth and maintaining our key performance metrics has been our challenge and I am delighted to say that we as a team have not only managed this task but have exceeded the expectations of our customers. We need to continuously drive innovation and differentiation into our business to meet the demanding challenges of the premium seating market and grow our portfolio of products to match our competition and customer demands. I am confident we can do this and I am looking forward to these challenges for EADS Sogerma". ☒

02



Web: www.sogermagroup.eads.net



www.aircraftinteriorsinternational.com

The Aircraft Interiors International website hosts a digital version of both this 2013 Showcase and the latest version of the Aircraft Interiors International magazine – plus a digital archive of past issues – as well as all the latest news, videos and exclusives you need to stay informed. You can also register to receive FREE future issues and learn more about our advertisers via our FREE online reader enquiry service.

clearvision

The rapid development of LED technology aims to reduce lifecycle cost, provide long-lasting light units, eliminate disposal cost of fluorescent lamps, and reduce weight

01. Coined optics offer lower power consumption than typical LED systems, and give out brighter, more uniform light



LED point source light creates challenges for traditional designs, which produce limited surface area illumination and harsh bright spots that must be diffused using a thick plastic lens.

Michael A Cherock, founder of Powerhouse Design Architects and Engineers of Pittsburgh, Pennsylvania, quoted in the *Pittsburgh Post Gazette*: “The downside of LED lighting is light quality. LEDs have a bluish cast that does not allow an accurate view of colours. The emitter appears as though the moon rather than the sun is the lighting source.”

Vision Engineering’s optical coining technology creates excellent uniformity, which can illuminate a target area without using diffusers. Coined optics evenly distribute light emitted from LEDs to reach the targeted surface, resulting in lower power consumption and higher illumination. Optical coining uses fewer LEDs, while projecting more light that mimics sunlight and eliminates hotspots on surfaces.

“We’re making it easier and more affordable for LED solution developers to get the light where they want it, and need it, without optical engineers and designers,” states Henry Avila, CEO of Vision Engineering. “We match our unique optical design capabilities with Luxeon LEDs to deliver quality results.”

Coining is a well-known process in the forging industry, whereby 3D shapes can be cold-formed to exacting tolerances that maintain their shape and angulations’ integrity, even after forming. To achieve a highly efficient reflective finish, the coined surfaces are vacuum metalised or bright dipped. Applying this technique to lighting where multiple geometric surfaces can be created to control the distribution of the light, gives uniform illumination.

Combining facets to produce the best light levels and uniformity are subject to the target area needed to be



illuminated and the fixture placement in relation to the target area. A radius facet will allow more light to spread in the smallest facet size and is a good choice for creating uniformity. Linear facets are especially useful when a smaller spread of light is desired. The parabolic facet is used to concentrate light in a more focused area to increase light intensity in an area that would otherwise be noticeably darker.

Coined optics give the advantages of LEDs without the harsh lighting or heat dissipation concerns common to emitters. Using malleable metals, such as aluminium, brass or copper, the coined optic is mounted directly to the circuit board and conducts heat away from the board and provides dissipation of the heat generated by the emitter. Maximum heat flux is conducted away from the circuit board by the fixture and disbursed by radiation or convection to the ambient air, resulting in brighter illumination and longer LED life. The cooler the LED is kept, the greater the efficiency rises and average life increases.

Fabricating using coined metal fixtures can be done at a fraction of the cost of the most common method used today, which is a moulded plastic optic.

Plastic optic costs can vary from US\$0.50 cents to US\$1 when small-to-medium runs are made. The cost of a coined optic is less than US\$0.10 cents when small-to-medium runs are made.

Outstanding performance and economy leads the way in Vision Engineering’s development of low-cost efficient lighting solutions for today’s modern applications. Vision’s lighting products’ superior performance has led to its rapid development across a wide array of business, creating lighting solutions for commercial, industrial, residential, entertainment and transportation markets.

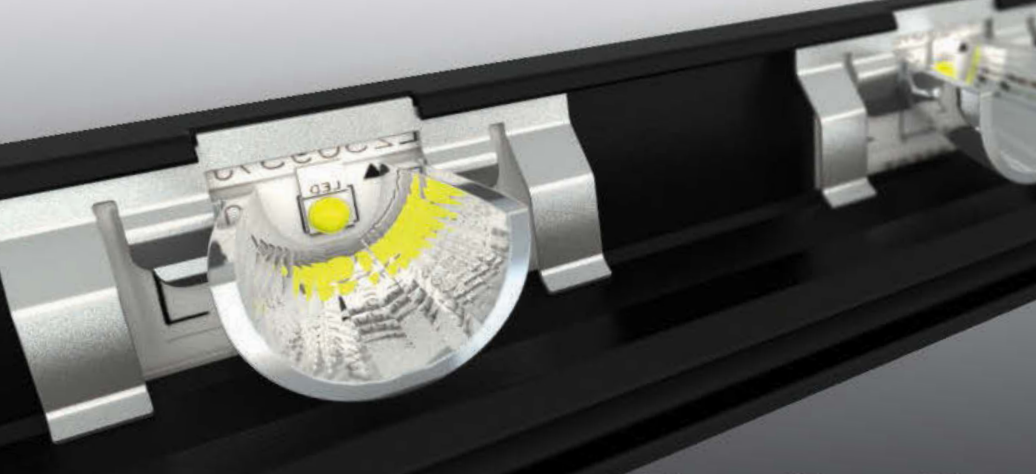
LED lighting systems for aircraft applications using optical coining technology produce ceiling lights that project light beyond the aircraft centreline, even for complex curvatures. Achieving uniformity in sidewall lights due to close proximity to the target surface is challenging when using standard LED reflective and refractive concepts. Coined optics splash the sidewall with uniform illumination that mimics natural sunlight. ☒

Contact: info@rare-solutions.com
Web: www.rare-solutions.com

EFFICIENT WALL WASH LIGHTING

Even Top to Bottom Lighting for Wall Washing

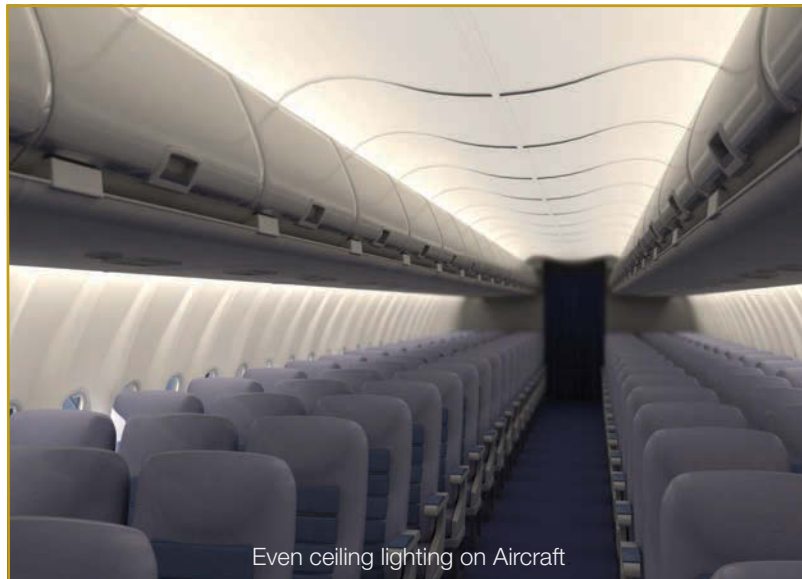
The VWW LED Wall Wash



Even side panel lighting.



Shown lighting a display.



Even ceiling lighting on Aircraft

Fixture Specifications

- Input Voltages:** 24VDC, 28VDC
- Freq:** 50/60 HZ
- Watts:** 16W, 32W
- Amps:** (16W) .610mA, (32W) .610mA
- Lumens:** 960 (16W), 2144 (32W)
- CCT:** 3500K, 4000K, 5000K
- Dimmable:** 0-10V
- Length:** 18", 36"
- Mounting:** Wall, Ceiling
- Finish:** Black, Silver
- Warranty:** 5 Years
- Lifetime:** 70K-100K hours
- Made in America**
- UL Approved**

Driver Specifications

- UL Class 2 low voltage**
- Input:** 120-277VAC, 50/60 Hz
- Output:** 24VDC, 100w max

The New VWW LED WALL WASH from Vision Engineering is specially designed to provide smooth and even quality light with High CRI.

With the input power of 24 volts, the VWW is able to daisy chain multiple fixtures together making it quick and easy to install.

Vision Engineering's Patented coined optic technology evenly distributes the light emitted from the LED's to precisely reach the targeted surface, resulting in lower power consumption and higher illumination.

Optical Coining uses fewer LEDs while projecting more light in a uniform pattern that mimics sunlight and eliminates hot spots on surfaces as close as 4" from the light source without using diffusers.

The SSL (solid state lighting) lifecycle length is based on the durability of all the LED components and how the design integrates them together, it's not just the LED chip. Vision Engineering exclusively uses LUXEON LEDs to deliver the highest quality results. This creates more uniform and crisp beams, as well as luminaire to luminaire consistency.

With the LED's lifetime exceeding 70,000 hours, you'll have lower labor & maintenance costs resulting in hassle free operation.



Patented coined optic



Dimensions: L 36" x W 1.8" x H 1.3"



justaddwater

International Water-Guard has signed with FACC for the design, build and supply of its new compact water module

01. This compact, lightweight module enables hot and cold pressurised water in lavs or galleys



International Water-Guard Industries (IWG) has been selected by FACC of Austria to design, build and supply the water system for the latest-generation Bombardier GL 350 programme. Deliveries of the IWG-M1 compact water module will commence in Q1 2014 and will run for the life of the programme.

“IWG is pleased to have been selected as a partner by FACC, a world-class aviation company, and looks forward to a long-term relationship with them,” says Bruce MacCoubrey, IWG’s president.

The IWG-M1 compact water module is also the first of its kind in the IWG product range, incorporating a high level of innovation. “This new and innovative compact water system expands IWG’s product line and offers the industry a lighter, smaller and more intelligent solution for water supply on VIP aircraft,” says Brian Ulrich, VP of engineering and business development at IWG. The purpose of the product is to deliver hot and cold pressurised water to an aircraft’s lavatory vanity or galley faucets.

For more than 25 years, IWG has been designing and manufacturing aircraft water distribution system components for use on business, commercial and military aircraft. This includes a complex water module, UV potable water treatment units, on-demand water heaters, water pumps, check valves and auxiliary indicator panels. IWG is an innovator in the design and manufacture of potable water systems for use in general aviation aircraft. New variations on all of the water system components are constantly being designed and developed for the future, keeping IWG at the leading edge of aircraft water systems.

In the business aviation industry, IWG is known as a dominant supplier of UV potable water treatment, but



THIS INNOVATIVE COMPACT WATER SYSTEM OFFERS A LIGHTER, SMALLER SOLUTION FOR WATER SUPPLY ON VIP AIRCRAFT

with its new compact water module, the company hopes to be the biggest player when it comes to any aircraft’s water needs.

The IWG-M1 module is very simple to operate. Just add water to the detachable water tank, apply power, and it is ready to deliver hot or cold water on demand, at consistent pressures and flow rates. The IWG-M1 is also considered the most intelligent, smallest and lightest self-contained system available in the marketplace. The module is ideally designed and suited for most mid-sized corporate,

commercial and military aircraft galleys and lavatories.

Other features include: a weight of just 9.5 lb; computer-controlled flow and pressurised regulation; an active freeze protection function; and remote monitoring and control capability.

Customising water distribution systems for any application is an important part of IWG’s design and manufacturing culture. Once supplied with installation parameters, IWG can provide OEMs and completion centres with personalised solutions for any project. ☒

Contact: sales@water.aero
Web: www.water.aero

INNOVATION

IWG

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- ON-DEMAND WATER HEATERS
- PUMPS
- **AND INTRODUCING THE IWG-M1 COMPACT WATER MODULE**

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


INTERNATIONAL
Water Guard



frontrow

Take a front-row seat for Bucher's 60th anniversary and enjoy the entertainment

 To celebrate its 60-year anniversary, Bucher has outlined a new and promising range of solutions. In addition to answering market needs with suitable extensions to its existing galley product range, the lightweight construction specialist has begun offering enhancements for the front row and other interior monuments. Bucher has also created a broad range of new solutions for IFE devices that provide additional value for passenger seats.

Bucher is founded upon lightweight construction principles and a passion for optimising available space that is applied to its full range of solutions. Advancements such as seamless integration of the front-row IFE, and innovative storage solutions within the forward galley, allow airlines to reap substantial benefits from cabin refurbishment projects. In order to fully capture these market opportunities, Bucher has gone beyond just offering suitable standalone solutions; the lightweight construction specialist collaborates closely with the seat manufacturer, IFE suppliers, external designers and, of course, the client airline to coordinate details of a project from start to finish. Bucher recognises the tremendous value to be gained from having close collaborative relationships with its business partners.

- 01. Front-row seat equipment is designed to meet current and future passenger needs
- 02. A pop-up IFE display deployment unit



Open lines of communication translate to a product that integrates into the aircraft seamlessly, and if a problem does occur, Bucher is able to identify and resolve it before it compounds.

DIFFERENT WITH A PURPOSE While Bucher's front-row monument (FRM) products have their roots in the company's proven lightweight galley principles, there are many differences that can be seen in the final designs.

Through the recent acquisition of Bucher Interiors, the company now possesses expertise in honeycomb panel processing, which allows for more generous free-form surfaces to be created. These surfaces open up new style and design possibilities that enrich Bucher's product offering and allow the company to cover a wider range of customer needs. Whereas for galleys the focus is on the integration of electrical, water, or cooling systems, the main focus for FRMs is on the use of quality decorative finish materials and complying with passenger abuse load requirements – areas that benefit from Bucher Interiors.

Today, Bucher celebrates a number of successfully implemented FRM projects. This success means the company's expertise continues to grow.

TRENDS IN SEAT COMFORT Such expertise also contributes to Bucher's engineering competence with other interior aircraft elements, in particular the seat and its surroundings. This is an area that is gaining attention given the current trends in customer comfort.

As the airline industry continues to pursue increasingly high levels of aircraft comfort, customisation and personalisation are on the rise. Creating innovative new designs while maintaining reliability is essential, and customisation is an opportunity to harmonise customers' unique visions with high performance and reliability.

Bucher regularly receives requests for deployable table or video arm designs for custom applications. Instead of designing each from scratch, it is often able to integrate customer requests into existing premium designs. By doing so, Bucher is able to reduce delivery times with no compromise in quality, functionality or reliability.

VERSATILITY AND EFFICIENCY Bucher's ability to integrate customers' requirements while still maintaining reliability is perfectly exhibited in the new line of IFE products for the Panasonic Elite 11in monitor. Bucher now offers several deployment



solutions, including a front-row and pop-up deployment unit that meet the growing demand for this monitor.

The front-row deployment video arm features double-jointed articulation, which precisely controls the position of the monitor throughout the entire range of motion. This mechanism also minimises the swing arc radius, which allows large-format monitors to be conveniently stowed under the seat.

The pop-up deployment arm offers a sleek, compact design to fit into tighter spaces, e.g. the seat arm or side ledge, while still accommodating a large monitor. The pop-up system uses proven Bucher deployment mechanisms that have undergone rigorous testing of more than 35,000 cycles. The mechanism deploys the monitor automatically to full height without assistance, swivels 180° for a quick exit without stowing, and tilts 70° to provide optimal viewing for any position. With such exact dimensional requirements, Bucher places emphasis on motion-control mechanisms to

prevent expensive damage to the surrounding furniture.

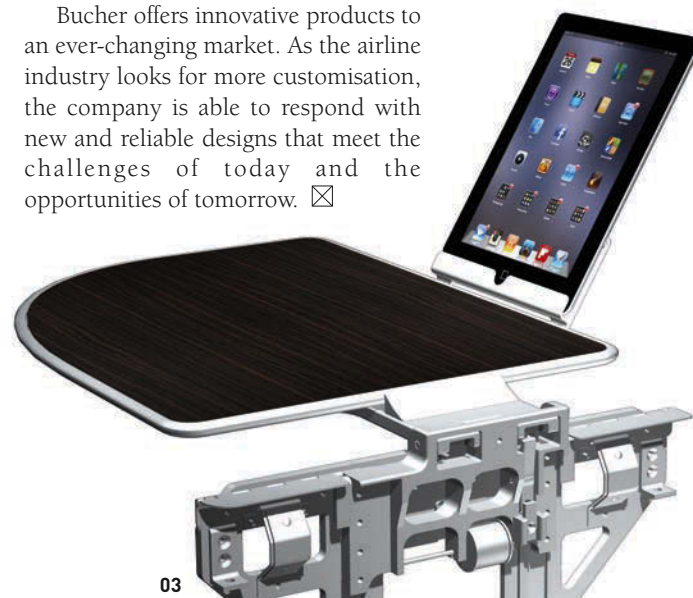
INNOVATION IN ROTATION The growing use of personal electronic devices, such as tablets, is changing the face of passenger travel. Airlines are continually pressed to customise the passenger experience. Bucher has recognised this market trend and in response has developed various new solutions. The rotating tablet stand (RTS) is the latest innovative design that can be adapted to Bucher's premium-class tables.

The RTS was launched at this year's NBAA show in Las Vegas. The RTS is a lightweight design that is machined out of aluminium and features positioning hinges to allow hands-free optimal viewing angles. The RTS also features grip pads that secure the device in flight and offer better overall protection. This design is conveniently

located underneath the table and rotates upward for usage. The low-profile design allows the RTS to be stowed in the same envelope with the table without additional changes.

Bucher offers innovative products to an ever-changing market. As the airline industry looks for more customisation, the company is able to respond with new and reliable designs that meet the challenges of today and the opportunities of tomorrow. ☒

03. The recently launched rotating tablet stand



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space savers

Cabin space is precious, especially in the single-aisle market. Three clever retrofit galley options can help maximise cabin density and improve comfort



- 01.** Diehl offers three retrofit solutions for the rear of single-aisle cabins, all of which focus on optimising the use of space
- 02.** The Diehl Aerosystems product line, which is available for cabin retrofits, includes LED lighting, as well as linings and monuments

As a first-tier supplier to major OEMs worldwide, Diehl Aerosystems delivers cabin interiors components and avionics solutions to almost every relevant aircraft manufacturer in the market. In addition, Diehl offers retrofit/upgrade solutions for aircraft already in service.

New products for this market segment were shown at Aircraft Interiors Expo in Hamburg in April 2013 and several arrangements of lavatories and galleys for the rear part of a single-aisle cabin were displayed.

Diehl offers three alternative solutions for space optimisation in the rear of single-aisle aircraft cabins: Space-Flex, High Density and SA Seatcount Flex. All three solutions

provide similar benefits, depending on the needs of the customer: enhancing passenger comfort and maximising revenue potential by increasing the total number of seats in the cabin.

The new Space-Flex and the High Density architecture offer enhanced space and functionality, and provide space for up to seven half-size carts for the Space-Flex galley, and eight half-size carts for the High Density solution. Both galleys can optionally be offered as chilled galleys. The two lavatories with space-optimised geometry can be easily modified during flight to one PRM-accessible monument.

The SA Seatcount Flex solution has been designed to allow clients to stow a maximum of galley equipment, but still provide two full lavatories in the aft of

the cabin. According to Diehl, the SA Seatcount Flex centre galley can store up to nine half-size carts and equals or even exceeds the classic galley G4.

Diehl claims competitive advantages for airlines installing these retrofit kits. The increased efficiency of the





DIEHL CLAIMS COMPETITIVE ADVANTAGES FOR AIRLINES INSTALLING THESE RETROFIT KITS

03. Diehl's retrofit solutions for galleys and lavs offer optimised use of space. Depending on configuration, airlines can gain up to six additional seats, as well as enhanced comfort

architecture allows the seating capacity to be increased by up to six economy seats (depending on the layout), or an increase of the seat pitch throughout the cabin, leading to improved passenger comfort.

Besides this efficiency solution, the Diehl package could feature updated linings in the cabin and door entrance areas, enhanced overhead storage capacity created by using trolley back doors, or new designed enlarged bins, as well as LED lighting that can be installed as line fit, replacing the conventional tubes. ☒



Contact: communications@diehl-aerosystems.de
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brightidea

Drop-in LED lighting upgrades can improve the flight experience for all passengers, as well as offering cost, weight and operational benefits

01. The B737 is one of the aircraft types the eFIT system was originally designed for
02. eFIT lighting provides sky effects on a Transaero aircraft



Airlines around the world are continuing to debate LED lighting upgrades for their fleets. While the obvious reason is maintenance – and that factor is often raised at the start of the discussion – the real driver behind these upgrades is to help airlines differentiate their fleet by enhancing the passenger experience. After all, they are fighting for their piece of market share.

Lighting isn't the only consideration in the quest to enhance the passenger experience. Cabin upgrades, such as connectivity, power and IFE, are all

part of this discussion. Lighting, however, stands apart from these other upgrades because it affects every single passenger, making it the single most important upgrade. Not only does lighting positively affect all passengers, it is the least expensive, and actually saves weight compared with connectivity, power and IFE upgrades.

LED lighting elevates the tone of aircraft cabins from the dim yellow hue of fluorescent lights to a crisp white light, providing even illumination throughout the cabin. The change in quality, colour and brightness opens up the cabin. Additionally, the introduction of coloured lighting further enhances the passengers' experience – and their mood – with subtle ambience.

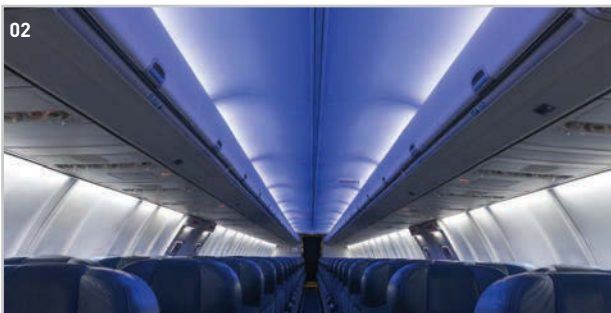
While new production aircraft are equipped with LED lighting, that still leaves a large number of aircraft in operation without – which creates a passenger experience gap. Emteq's focus on the aftermarket has driven it

to design products differently. This is unlike many lighting companies, who focus on the forward-fit market and don't design their products for simple integration into different aircraft.

Emteq's business model has played a significant role in enabling it to develop eFIT, a clever solution that successfully narrows the passenger experience gap.

DROP-IN LED eFIT is a true drop-in LED mood lighting system. This low-cost solution provides all the benefits of LED lighting to create a refreshed interior. As a dual-colour system with both white and blue, it provides colour combinations that mimic the sky's white and blue effects.

Originally designed for B737 and A320 families of aircraft, this system replaces outdated fluorescent systems, including all ballasts and power supplies. The eFIT system uses the existing mounting provisions and connectors, and can also interface





with existing controls and attendant switch panels. Emteq is expanding this solution for a majority of Airbus aircraft types – A318, A319, A321, A330, A340 – with both classic or enhanced CIDs.

Of course, some airlines want to take it to the next level, creating a passenger experience that reinforces their brand and strengthens their differentiation. Integrating a full mood-lighting system gives them this additional edge. The Quasar II full-spectrum mood-lighting system

provides unlimited options for the aircraft interior. The advanced design of the system means it can create highly customisable scenes with dynamic colours and intensity levels. Again, Emteq's model of aftermarket integration makes this a simple upgrade as it can be dropped in.

While passenger experience may be the driver for a lighting upgrade, LED lighting does still offer many significant maintenance and operational advantages. With the reduced downtime, reduced spare-part

inventory, reduced man-hours and reduced power consumption, in addition to being environmentally friendly, this upgrade to LED lighting is still a smart decision.

These same arguments apply to charter operators who want their fleets to be the top choice, as well as other executives and VIPs who simply demand the best. ☒

03. The Quasar II system offers an unlimited range of lighting colours

Web: www.emteq.com



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LED LIGHTING | CABIN ELECTRONICS | CABLES & TRAYS | DESIGN & ENGINEERING | CERTIFICATION

EMTEQ
emteq.com

2013 was another fantastic 12 months in the world of commercial aircraft interiors. Here are a few of the highlights that shaped the year:

JANUARY

It was a strong start to the year for EADS Sogerma, as the company completed the technical validation process of its Equinox full-flat business seat, making it officially offerable on the B787 Dreamliner. This marked not just a new seat, but also the first EADS Sogerma product to be included in the B787 catalogue.

FEBRUARY

Iberia, Spain's flag carrier, needed to attract more passengers to its long-haul routes, and its new A330 and A340 cabin designs could provide the temptation. In a four-year project, a refreshed new look, designed in conjunction with Mormedi, Interbrand, YourStudio and others, was created for the cabins, complete with a redesigned seat and LOPA in business class for more capacity and comfort, and a little more seat comfort in economy.

MARCH

KLM revealed its B747-400 business class, created in conjunction with top Dutch designer Hella Jongerius, to offer greater comfort and privacy, as well as a vital step-up to full-flat seats. Jongerius trimmed the cabin and the customised B/E Aerospace Diamond seats in more subdued tones, and even specified carpeting manufactured partly of discarded KLM ladies' uniforms. Traditions such as the 'KLM blue' and the Delft Blue houses remain though.

APRIL

Budget airline EasyJet rarely features in *Aircraft Interiors International*, so it was interesting to see the carrier sign a deal with Recaro for the supply of 2,500 SL3510 slimline economy seats for 14 of its A320s. Apparently the new seat has over 100 fewer parts than the previous choice, helping to save a claimed 600kg per aircraft.

MAY

The CLIO Awards, one of the world's most recognised awards competitions for advertising, design and communications, awarded Futurebrand a trophy in the Corporate Identity Design category for its work on American Airlines' brand update – the first time an airline brand has been recognised in this category.

JUNE

Priestmangoode chose the Paris Air Show to announce its latest tie-up with Embraer, to design the interiors of its forthcoming E-Jets E2 range of 70-130 seat narrow-body aircraft. The brief will see Priestmangoode deliver the new interior design for the range, covering the complete passenger cabin, including all interior architecture, as well as seating across all classes. The studio said that the interiors would establish "a new benchmark in cabin design".

JULY

This was one of the most exciting months we have ever seen in the world of aircraft interiors, with launches of not just British Airways' new A380 and B787 aircraft with revised cabins, but also Singapore Airlines' new B777 interiors, designed with JPA Design and BMW DesignworksUSA.

AUGUST

A major new name entered the commercial aircraft interior design arena: Foster + Partners. This world-famous London-based firm of architects arrived in style, creating a refreshed first class for Cathay Pacific's B777-300ER fleet.

SEPTEMBER

New York-based JetBlue Airways stunned the market when the all-economy airline unveiled a fully customised lie-flat seat, including a mini suite, heralding a new direction. The seats, manufactured by Thompson Aero Seating, are expected to debut on JetBlue's 11 new transcontinental A321s.

OCTOBER United Airlines unveiled a new, more modern-looking signature seat design focused on customer comfort and environmental responsibility, which will also give the fleet some much needed consistency following the merger with Continental. Ultimately, United plans for more than 60,000 seats on more than 500 aircraft to carry the new design.

NOVEMBER

To celebrate its 90th birthday, Finnair highlighted its continuing passenger experience enhancements, including retrofitted fully flat beds in business, new IFE on all long-haul flights, and an improved lounge offer.

DECEMBER

It's too early to say at the time of writing, but we do know that 2014 will be another bumper year, with new interiors such as Qatar's A380 and A350 to look forward to, as well as Etihad's A380 and B787. We can't wait!



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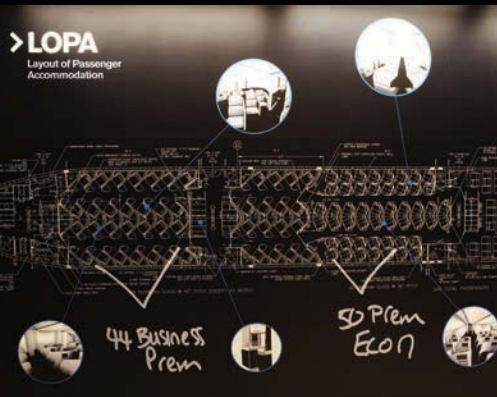
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