Aircraft interiors INTERNATIONAL

2011SHOWCASE

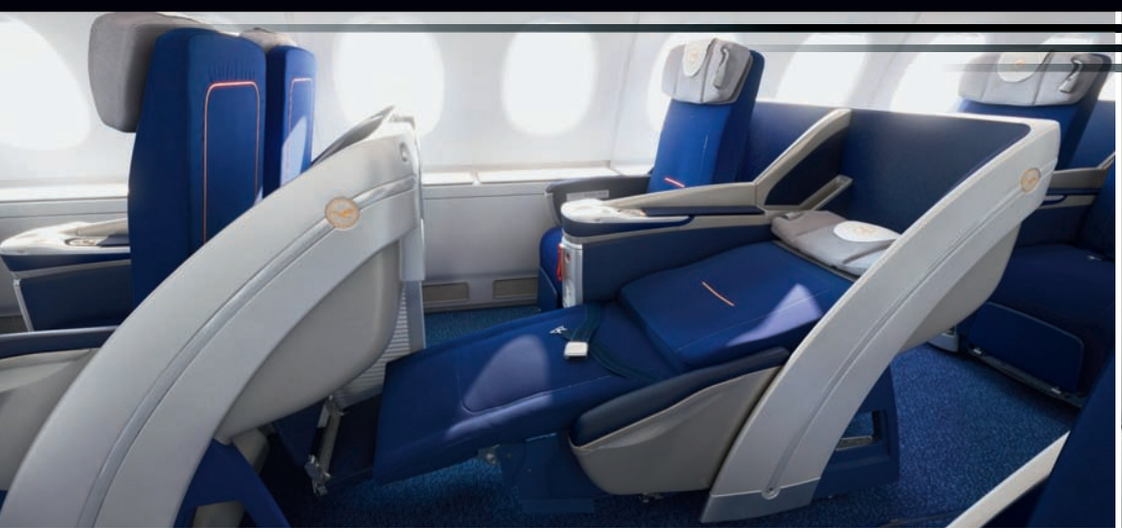
THE INTERNATIONAL REVIEW OF AIRCRAFT INTERIOR DESIGN AND COMPLETION

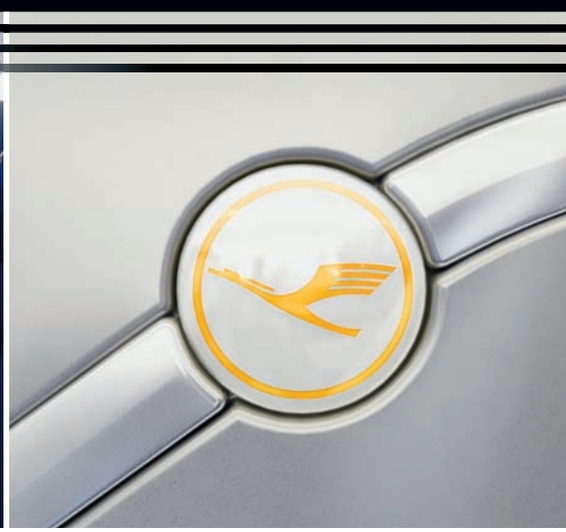
2011SHOWCASE

INSIDE: LEADING DESIGNERS & SUPPLIERS SHARE THEIR INSIGHTS

RECARO

the seat of innovation





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CL6510 – maximum living space in the business class.
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standanddeliver

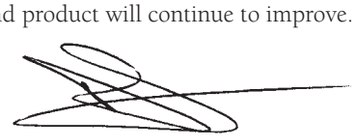
Welcome to the 2011 Showcase – this year we've changed things around a bit and introduced a much stronger design focus. For airlines looking for external design help, we hope the new format proves particularly useful. Within its pages you will find the leading agencies from around the globe specialising in aircraft interior work. Each studio presents its unique perspective on the sector, while referring to their most recent and relevant projects – from first class through to economy; from the A380 to the 787; from seats through to check-in desks and uniforms – the Showcase provides an unrivalled resource for anyone working in the business.

Why does design matter? If you're still asking that question, you should probably think about getting out of the industry. You'll find countless answers within these pages, but in the simplest terms, design not only helps an airline to stand out, it can also help it to actually stand for something. Rather than trading merely on price (an important consideration but ultimately destructive), design can actually add value – and for passengers who fly regularly, particularly for more than a few hours at a time, this is a very important concept.

Design can help to make them feel more like an individual and that their comfort, opinions and well-being actually matter to the airline they are flying with. But it's not just about passengers – the real beauty of design is its ability to unlock potential new revenues for carriers through the vigorous analysis of different marketing models, cabin configurations and better integration of emerging technologies.

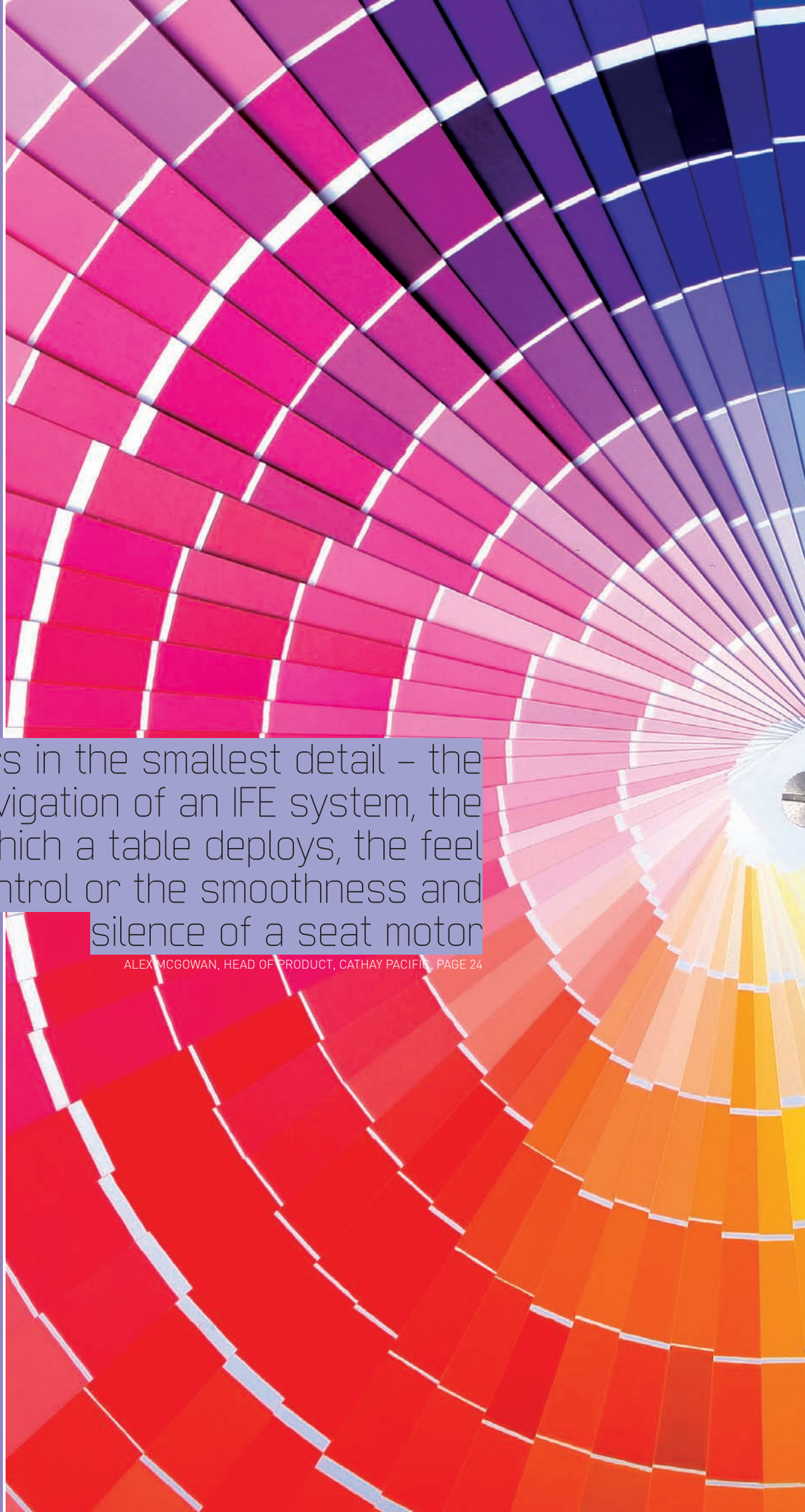
It's also not just about the design firms – the airlines themselves have much to offer, and we speak to five leading carriers on page 22. "Design matters in the smallest detail: the ease of navigation of an IFE system, the precision with which a table deploys, the feel of a seat control, or the smoothness and silence of a seat motor," says Alex McGowan, head of product, Cathay Pacific.

And then there are the suppliers – it's their job to actually deliver the creative vision – while navigating their way through a maze of restrictions that include strict safety testing, regulatory requirements, and low-volume production runs. However, with everyone on board early enough in the project, and with the correct design management tools in place from the start, there's every reason to believe the end product will continue to improve.



Anthony James, editor

features



Design matters in the smallest detail – the ease of navigation of an IFE system, the precision with which a table deploys, the feel of a seat control or the smoothness and silence of a seat motor

ALEX MCGOWAN, HEAD OF PRODUCT, CATHAY PACIFIC, PAGE 24

design showcase

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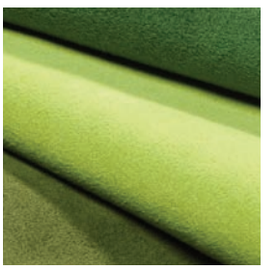
supplier showcase



Tapisuede™ Strie

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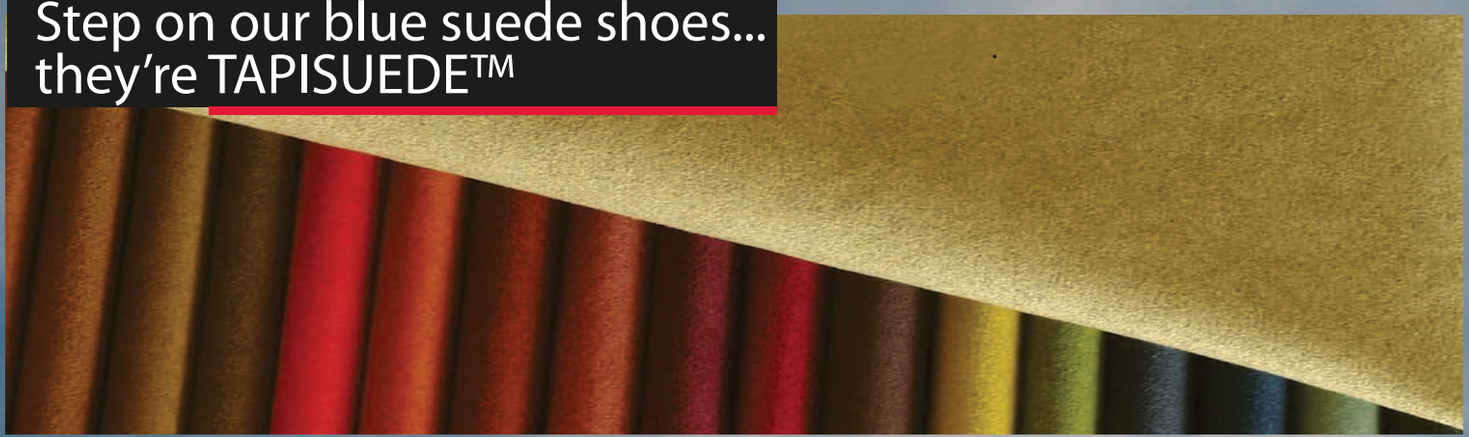

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insideout

Joe Ferry, until very recently head of design at Virgin Atlantic, provides some honest insights into the design management process

Q&A

JOEFERRY

> IF BADLY MANAGED, CONSULTANTS CAN CREATE CONCEPTS THAT ARE IMPRACTICAL AND EXPENSIVE

WHEN DOES AN AIRLINE NEED HELP FROM AN EXTERNAL DESIGN AGENCY?

If an airline chooses to be competitive by creating product differentiation for its brand, services or products then they could benefit from commissioning external creative agencies. Design consultants can bring fresh thinking, high levels of design expertise and a view of design trends and standards from outside of the industry. Unfortunately, if badly managed, they can also create concepts that are impractical, expensive to build and difficult to maintain.

Airlines need a realistic expectation of what can be achieved within the costs and time frames they have and their own ability and knowledge of design management.

WHY NOT JUST DO IT ALL IN-HOUSE?

An airline that's serious about the health of its brand will probably be making the shrewd investment in an in-house design team. If you have an in-house group of highly talented designers, like the ones I had the privilege of working with at Virgin Atlantic, you may decide to bring all work in-house. This works effectively and ensures much greater confidentiality and better protection of intellectual property and know-how.

I personally feel the collaboration of an in-house design team with external agencies is a powerful combination. The in-house team has extensive knowledge of the industry's restrictions and complete ownership of the design's lifecycle. That, coupled with the unconstrained creativity of an external agency, can result in award-winning designs that contribute to the airline's profitability and maintain brand equity.

ANY ADVICE ON SELECTING AN EXTERNAL AGENCY?

The chief considerations when choosing an outside agency are very much dependent upon the design management competency within the airline. If you have experts in design management within your organisation, it will afford you the opportunity to recruit new and exciting agencies that could be high risk due to their lack of aviation knowledge but could also produce exceptional designs. For airlines without in-house expertise or with limited experience in using design agencies, the option of larger or more experienced agencies with a track record within the aviation industry could be a safer option. An agency that can hold the airline's hand in the design world could be a lower risk option if the airline's expectations are realistic. However, this is never guaranteed.

IS PREVIOUS AIRLINE EXPERIENCE ALWAYS NECESSARY?

It can become limiting if you select agencies only when they have previous experience in the industry. Some airlines may find the choice quite constraining.

> BE PREPARED TO MOUNT A LEGAL CHALLENGE IF YOU BELIEVE YOUR DESIGN IS BEING INFRINGED

HOW DO YOU ENSURE YOU GET THE RIGHT RESULT?

Using design more effectively starts from within the airline itself. The way projects are aligned within the company is critical to the success of introducing new developments. The design leadership team needs to ensure that, from the CEO through to the team who will interact with the design on a daily basis, everyone has bought into the vision and are fully supportive to seeing a successful conclusion in a collaborative way. A design agency is just one member of this bigger team and for it to be as effective as possible, the airline needs to ensure alignment and clear goals between the agency, manufacturers and the airline itself. This makes selecting the right agency even more critical. An agency with egos that won't listen to the needs of the other parties can be quite destructive and result in designs that looked good on paper but lose a great deal in their execution.

HOW DO YOU ENSURE OWNERSHIP OVER THE END PRODUCT?

Unfortunately, if you are truly innovative, it is highly likely that the competition will attempt to replicate your designs. Be prepared to mount a legal challenge if you believe your design is being infringed and to that end it's important to ensure you have protected your intellectual property effectively.

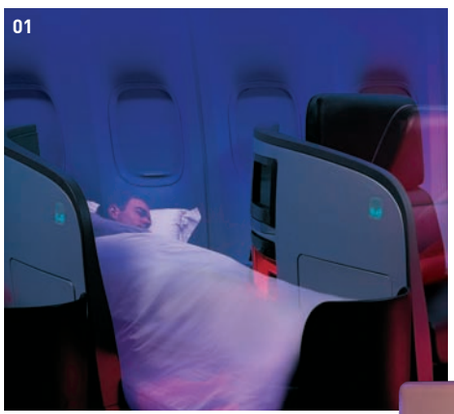
One of the disadvantages of using external agencies is that there is little you can do to prevent the knowledge that they gain from collaborating with you being imparted to the next airline they work for. Non-competition clauses can be introduced but usually expire before your products are installed on the aircraft due to the exceptionally long lead times involved in the industry.

HOW CAN DESIGN BE USED MORE EFFECTIVELY BY AIRLINES GOING FORWARD?

Establish a very clear and realistic vision of what you are expecting and why. This will help you determine which of the many compromises along the development journey will be acceptable and which are non-negotiable. Set expectations to a level your manufacturers can deliver in the time, budgets and standards that have been signed off. Make a very determined effort to stop designing at critical points in the development process. Designers will always strive to improve their ideas but a cut-off point is essential to give engineers and manufacturers the opportunity for their work to be based on designs that are frozen. When it comes to liaising with manufacturers, an aligned team of designers, engineers and manufacturers all focusing their efforts in the same direction with a common goal will ensure a fighting chance to get designs delivered to the correct standards on time and to budget. Most importantly always remember that ultimately you are designing for your passengers – prioritise their needs in all your decisions.

pastures new:

Former head of design at Virgin Atlantic, Joe Ferry joined Intercontinental Hotels Group (IHG) at the end of September as the company's senior vice-president of global guest experience and design to oversee the execution of IHG brands and seek out potential innovation opportunities. At Virgin, he helped create the carrier's overall brand identity, including its interiors, uniforms, check-in areas and airport lounges.



01. Virgin Atlantic's Upper Class Suite
02. Upper Class bar

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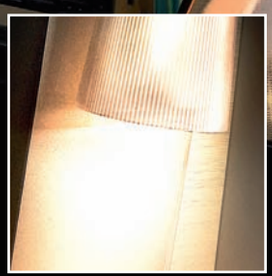
AD103

JANUARY

cuddle class

Air New Zealand kicked the year off with a bang when it announced plans to transform international air travel with its new 777-300 fleet, the first of which is due for delivery this November. In particular, its Recaro-supplied Skycouch made headlines worldwide, with the airline praised for its efforts to improve the lot of long-suffering economy passengers. A specially designed row of three seats, each Skycouch converts into a flat surface ideal for couples to snuggle up on. New Spaceseats (from Contour) in a 2-2-2 herringbone formation feature in premium economy, while it's business-class flatbeds, licensed from Virgin Atlantic, have also been enhanced.

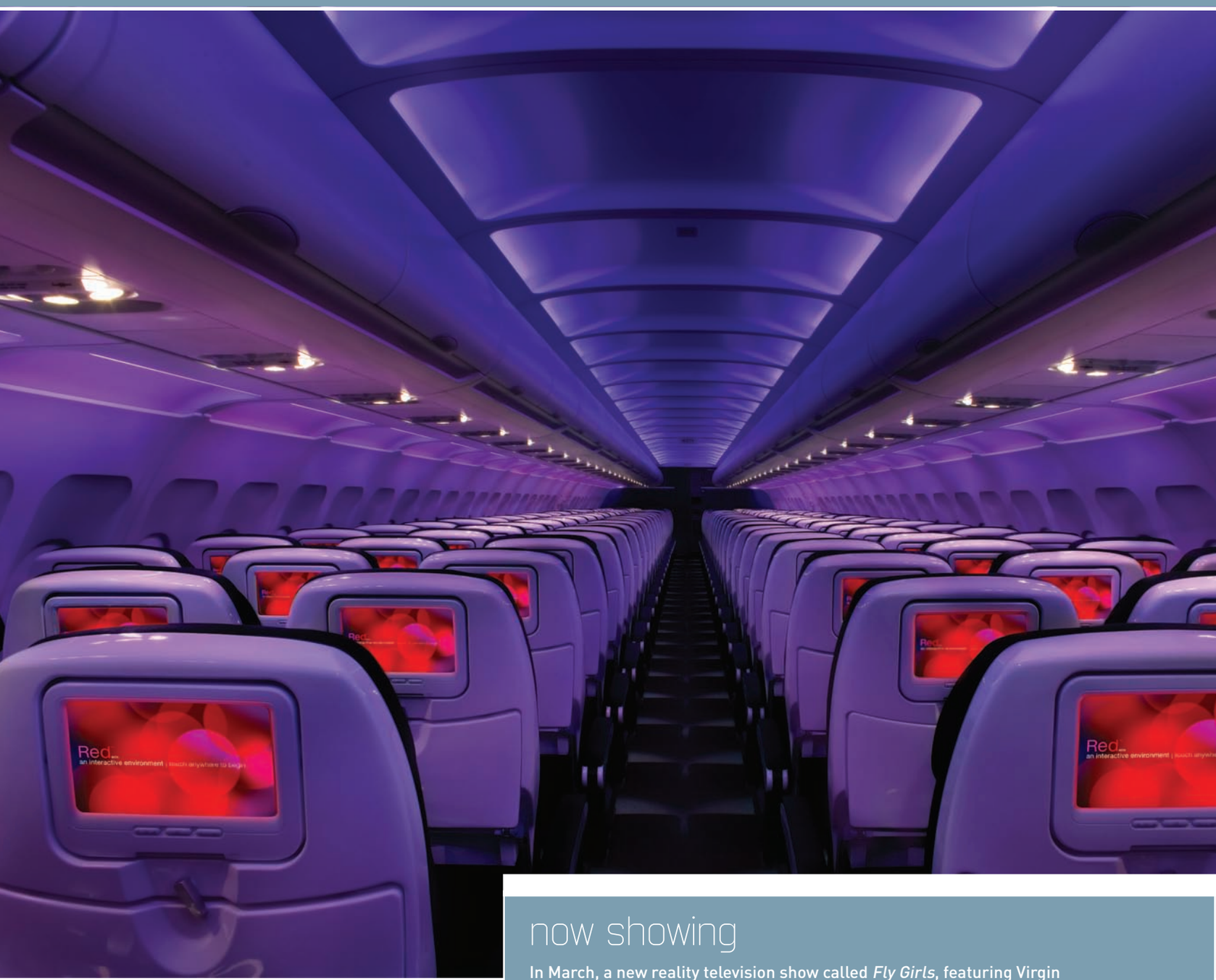
FEBRUARY



first person

British Airways finally launched its new First cabin on a B777-200 bound for Chicago on 10 February 2010, having first begun work on the project back in 2005. The airline worked with UK design firms Tangerine and Forpeople on the project, spending £100 million in the process. A redesigned suite, from B/E Aerospace, includes a 78in-long, 32in-wide bed, some 60% wider at the shoulders than its predecessor. A personal wardrobe, leather-bound writing desk that converts into a dining table, 15in IFE monitor and buddy seat complete the offer. Personal electronic blinds and stylish sidewall panels combine to give passenger's greater ownership over their individual space.

MARCH



now showing

In March, a new reality television show called *Fly Girls*, featuring Virgin America's cabin crew, began airing on The CW network, a US television channel. The airline marked the programme's launch with an inflight premiere on a flight to Las Vegas. The *Fly Girls* cast (pictured, left) served cocktails while passengers got a sneak peek of the first episode on Red, Virgin America's touchscreen IFE platform. However, the show was officially cancelled in May after only eight episodes – and a widespread panning from critics and the Association of Flight Attendants for its rather dated portrayal of life as a female crew member.

APRIL

golden opportunity

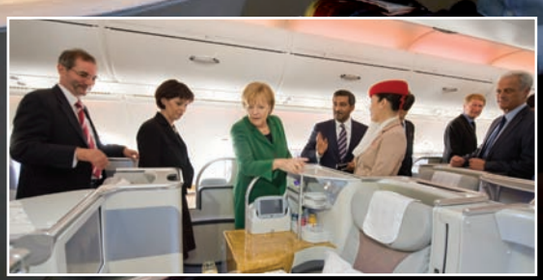
Air Canada began operating a B767-300ER between Toronto and Los Angeles in April, in response to a major increase in demand for flights between Toronto and California. The aircraft features lie-flat business-class seats complete with the latest AVOD IFE system and power plugs and USB ports. The airline also launched a new daily service between Toronto and Orange County on 8 April, using a 120-seat A319; and a new route to San Diego and increased its services to San Francisco – both using an A319. Air Canada has since announced plans to work with United Airlines on a revenue-sharing joint venture on transborder flights.

MAY

quiet storm

Lufthansa took delivery of its first A380 on 19 May at Airbus' plant in Hamburg-Finkenwerder, Germany. It has since received a further two A380s, with all three aircraft operating from its Frankfurt base. The German carrier's A380s are equipped with 526 seats in total: with a first-class cabin featuring eight luxurious suites on the upper deck; a 98-seat business-class cabin immediately behind; and 420 economy seats on the main deck. First class, designed in conjunction with Priestmangoode, features sidewall insulation, soundproof curtains and sound-insulated floors to reduce noise in the cabin, while an air humidification system, the first to be installed on a commercial airliner, further improves passenger comfort. The airline also worked with müller/romca industrial design on two spacious first-class bathrooms featuring the first inflight urinals.

JUNE



rich pickings

Amidst all the economic doom and gloom of a difficult year, Emirates brought some much needed optimism with an order for no less than 32 A380s, valued at a list price of US$11.5 billion (£7.8 billion). Signed during a ceremony at the Berlin Air Show on 8 June, the deal was witnessed by German chancellor Angela Merkel. The airline also reported profits up 416% to close at US$964 million (£653.5 million) over its 2008-09 profits of US$187 million (£126.8 million). Already an A380 operator, the airline received its tenth such aircraft on 7 June, having received its first A380 back in July 2008. Emirates is the only airline to install onboard showers in first class, along with 14 suites with sliding doors. Pierrejean Design Studio in France provided design support. First- and business-class passengers share a bar (pictured) at the front of the upper deck, with 76 staggered (1-2-1) business-class flat beds behind.

JULY

sneak preview

July saw the Dreamliner make its international debut at the Farnborough International Airshow. B787 flight-test aircraft, ZA003, touched down at Farnborough on 18 July, attracting long queues of visitors keen to see inside. Boeing is using ZA003 to test and certify seats, galleys and associated cabin safety and comfort systems. In the same month, Boeing also revealed it had settled on North Charleston, South Carolina, USA, as the location for its new 787 interiors fabrication facility. Meanwhile, TUI Travel, which owns Thomson Airways, revealed details about what passengers can expect on board its B787s, the first of which is scheduled for delivery in January 2012. Thomson is working with Honour Branding (*see page 46*) on its plans for the cabin.

AUGUST

done deal

Zodiac Aerospace's purchase of Sell, a leading galley and galley insert supplier, from the Premium Aircraft Interiors Group (PAIG) in August underlined a clear trend for increasing market consolidation. Zodiac had previously acquired C&D Aerospace in 2005 and Driessen Aerospace in 2008. Sell also manufactures the luxurious, leather-clad personal wardrobes for Lufthansa's A380 first class, pictured above. The tie-up followed the sale of Dasell Cabin Interiors, another PAIG business unit and a major supplier of aircraft lavatories, to Diehl Aerosystems earlier in March. Diehl now looks set to become the third major supplier in the interiors sector, with US giant B/E Aerospace also offering a complete package of cabin products.

SEPTEMBER

big picture

The Airline Passenger Experience Association's (APEX) annual convention in Long Beach in September saw IFEC provider Thales present its new TopSeries smart video display, integrated into a Recaro CL 3620 economy-class seat and a B/E Aerospace Pinnacle unit. Each display is essentially a self-sufficient IFE system, with high-capacity local storage and no seatbox. Thales says this improves serviceability and reduces cost of ownership. The monitor, available in various colours, features four passenger interface modules for personal electronic device connection, and a reader for chip-and-pin and smartcards.

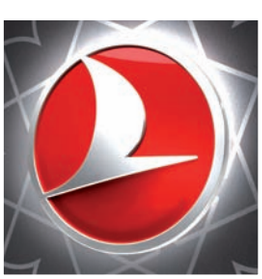
Improved design and a strong focus on seat/IFE integration was an important theme throughout the year, with Panasonic's Integrated Smart Monitor (ISM) winning its first customer – Delta will install the screens (fitted in Weber's 5751 economy seats) on 16 Boeing 747-400s previously operated by Northwest Airlines. Teague worked on the ISM's design, which combines slimline features with a capacitive touchscreen interface.

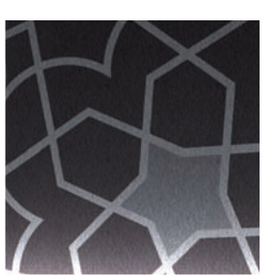
OCTOBER

united front

The trend for market consolidation among interior suppliers reflects a similar trend among actual carriers – the approval in October of the merger between United and Continental a strong case in point. Both have invested heavily in premium cabins – will the new entity persevere with two separate products? Or will it choose a completely new approach? Or will it favour one over the other? The new logo would suggest United has the upper hand – it features the word 'United' in a custom sans-serif font, next to Continental's 'globe' icon. The combined airline's aircraft livery sees Continental's livery, colours and design, including its blue-gold-white globe image on the tail, combined with the United name on the fuselage. B/E Aerospace certainly has a lot riding on the eventual outcome: it supplies United's first class (pictured, right) and business class (both featuring design input from Pentagram). It also manufactures Continental's BusinessFirst (pictured above), for which it provided design support. Both carriers have 787 orders – it's unclear whether the merger will prompt a rethink on their Dreamliner interior plans.

NOVEMBER/DECEMBER





complete package

Writing this in October, it's hard to know what November and December will hold... however, *Aircraft Interiors International* is very excited about the expected launch of new interiors from Turkish Airlines, with design provided by Priestmangoode. No official launch date has been confirmed, but it's highly likely the airline will receive its first 777 featuring the new interior before year end – giving extra meaning to those who enjoy a bit of 'turkey' around this festive time of year! The airline isn't just splashing out on new interiors – the brief covers its entire brand, with ground services, check-in counters and lounges included. The push to create more seamless travel experiences is another important trend going forwards.

TECHNOLOGY

P/N: MR4AA1-01
Model: microwave

P/N: HFES0028-20
Model: Nespresso maker

P/N: HFA2000-10
Model: beverage maker

P/N: HFWF2003-01
Model: trash compactor

P/N: FT048
Model: folding trolley

P/N: HFE2007-01
Model: espresso maker

P/N: MK667-4402
Model: full-size trolley

P/N: R4AD2-01
Model: induction oven

INNOVATION

P/N: IHP4
Model: induction hot plate

P/N: HFA2007-01
Model: beverage maker

IACOBUCCI HF

P/N: HFE95-20D10
Model: Nespresso maker

P/N: HFAWB2005-01
Model: water heater

P/N: MB0000750
Model: trash compactor box

P/N: HFWH2003-02
Model: trash compactor

P/N: 9501D
Model: espresso maker

P/N: AAD4-07
Model: induction oven

P/N: HFN2007
Model: beverage maker

P/N: HFA28V
Model: beverage maker

CARE

P/N: HFE95-20D
Model: espresso maker

P/N: A001
Model: vip seat

P/N: HFWH0028-02
Model: trash compactor

P/N: MK279-00
Model: half-size trolley

P/N: HFEJ2008-01
Model: Nespresso maker

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sales@iacobucci.aero
www.iacobucci.aero

P/N: HFAWB2007-01
Model: water heater

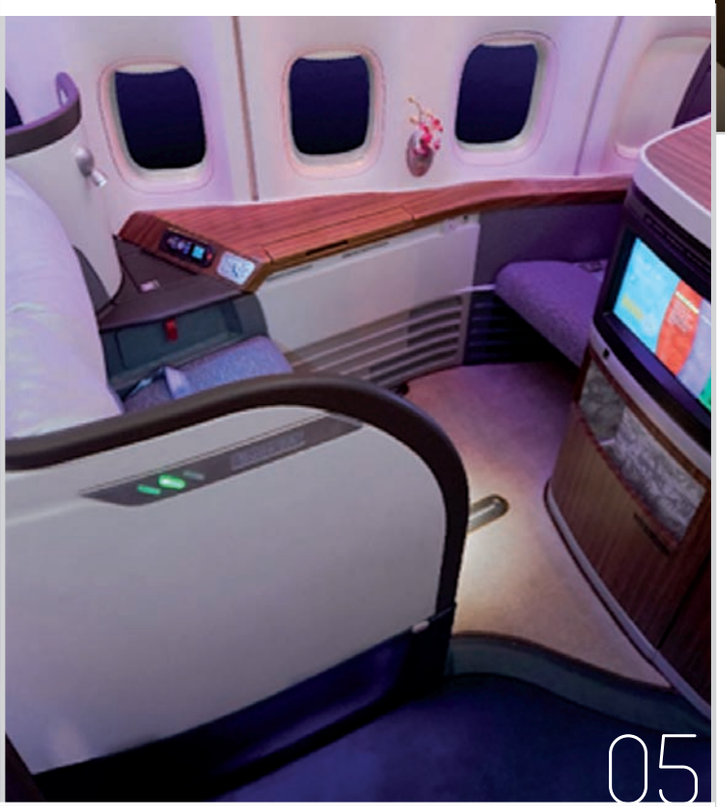
TRADITION

01

02

03

04



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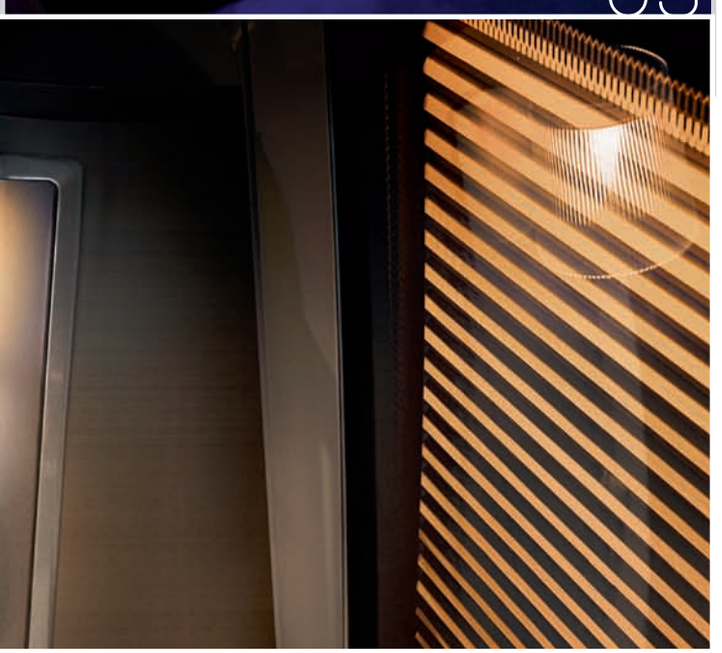


takefive

How important is design to the leading airlines and where are the future opportunities to differentiate the onboard experience? Five in-house experts share their views

GUY BIRD, AIRCRAFT INTERIORS INTERNATIONAL

Design is viewed by many brand experts as one of the last true differentiators among products and services of all kinds that share increasing degrees of basic commonality. Some airlines stress this association explicitly, with Virgin America variously describing itself as "design-centric" or with "design as part of its DNA", but even less obvious design-obsessed companies like Lufthansa still credit the discipline's importance to its business: "Lufthansa has put a high importance on design in the past and present over-spanning corporate design, web and mobile, and ground and inflight product without being design-driven," says Björn Niklas Bosler, aircraft interior branding and design manager within the German carrier's product management and innovation department.

As Bosler's point recognises, design creates an impression of the airline long before any passengers set foot on board, and indeed can be a major impetus to encourage customers to do so at all, whether they actually realise it or not. Cathay Pacific may stress that the heart of its brand is its warm, friendly and professional staff but it too realises that designing the environment in which those staff work is still massively important. "Good design matters and makes a difference everywhere," says Cathay's head of product, Alex McGowan. "The first impression when a passenger logs on

01. SWISS First
02. Virgin America's RED IFE system
03. British Airways First
04. Lufthansa A380 first-class cabin
05. Cathay Pacific first-class cabin

> IT'S UNBELIEVABLE HOW MUCH OF A DIFFERENCE IN EXPERIENCE GOOD LIGHTING CAN MAKE

06

07

06. BA First
07. Virgin America's first-class cabin

to our website or mobile application, calls our reservations centre, walks into a lounge or boards an aircraft, creates an immediate and tangible emotional response. We want to ensure that this is a positive one and comes with the reassurance of a smooth and enjoyable journey ahead. Design matters in the smallest detail – the ease of navigation of an IFE system, the precision with which a table deploys, the feel of a seat control or the smoothness and silence of a seat motor."

Swiss Air is another carrier that considers such a joined-up approach as vital. For proof, it cites the tangible example of a lamp used in its first-class airport lounge as providing the inspiration for the reading light integrated into its first-class suite on board, providing a subtle but important continuity.

LIGHT-HEARTED APPROACH An area of the cabin that traditionally gets a lot of attention is, unsurprisingly, seating, with continual strides being made in ergonomics and comfort. However, other areas – notably lighting – are also now garnering fresh attention. British Airways' design lead Peter Cooke says big investments have been made of late on new lighting systems for the carrier's First and Club World cabins "to provide the perfect ambience for each stage of the journey". Meanwhile, Virgin America's director of engineering Ken Bieler cites its current mood-lighting system that features 12 scenarios based on daylight cycles as an important marketing factor: "It helps soothe and relax guests and even gradually awakens them on a red-eye," he says. "It is unbelievable how much of a difference in experience good lighting can make."

All five in-house designers at the airlines interviewed for this feature – British Airways, Lufthansa, SWISS, Cathay Pacific and Virgin America – said they were happy to utilise outside agencies to help them reach their goals. Beyond the necessity of small in-house teams getting outside help as they rarely have the wide-ranging know-how or manpower to undertake all the necessary functions alone, it's their ability to think beyond the industry as a result of their wider experience designing across many sectors that really inspires: "We have four people internally that manage design projects and work closely with our external design agencies," says British Airways' Cooke. "The reason we use them is to ensure we are continually looking outside the airline industry for innovative solutions to complex problems."

Nonetheless, any prospective design agency should tread with caution – understanding the individual airline brand's positioning and the particular constraints of the airline industry's safety legislation is a regularly cited 'given' from the client. However, this is sometimes underestimated by agencies used to working in industries with more forgiving regulation.

JOINING THE DOTS As to where the opportunities may lie for design differentiation, refreshingly our respondents cited a variety of areas for investigation and research. For Virgin America's Bieler, connectivity is a key game-changer.

09

08

Against a back drop of airlines historically treating flights as no-go time for internet use, Virgin America now claims to be the first carrier to offer WiFi on every flight, with standard power outlets in every seat. "The future of in-flight entertainment and design will unquestionably be linked to increasing connectivity," says Bieler.

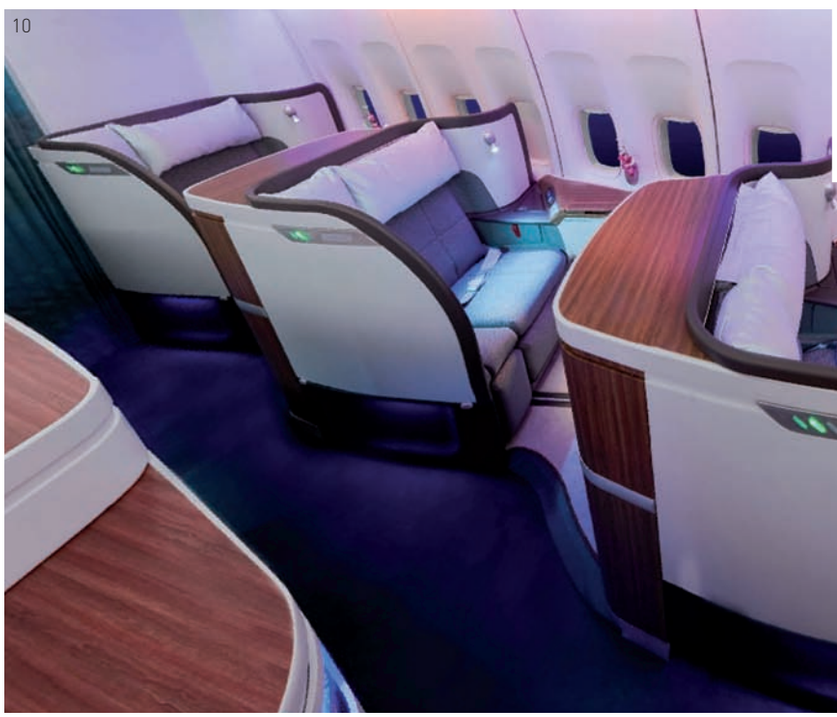
A more general feeling that space inside cabins could be better utilised in the future was also voiced by several parties from Lufthansa's Bosler to BA's Cooke, with the latter particularly seeing room for improvement in economy. "Some real innovation is required here to improve the passenger experience in a small space, improving the recline and cradling the passenger," says Cooke. "We should also be looking at unused spaces within the aircraft, below deck or above ceiling, as space will have an increasing premium."

Materials that might help airline design teams in their stated goals include lightweight yet strong substances such as titanium and carbon fibre, as well as nano coatings and 'crush core' manufacturing, which according to Cathay Pacific's McGowan, "allow real optimisation of passenger space". Unfortunately many of these materials are currently expensive to produce and test against existing legislation. BA's Cooke espouses looking beyond the airline industry for best practice in this respect to avoid stagnation: "The pallete of materials available to the designer for onboard products has actually reduced due to increased testing requirements and because it's a relatively small market sector for material manufacturers the incentive for development and innovation is not there," he says. "We need to be looking outside the industry and possibly investing more up front to develop lighter weight stronger materials."

SAME DIFFERENCE Meanwhile individual carrier brand identities are under pressure from demands from aircraft manufacturers for greater product standardisation. But do airline design teams see any benefit in this 'catalogue-style' stance? Alexa Luppi, manager of cabin interior development at Swiss Air welcomes such a modular approach for areas of the cabin like the galley – that is almost invisible to the client – logically suggesting quicker testing and certification of those areas would follow. However, she warns that in customer-facing areas, new

08. Lufthansa A380 first-class bathroom
09. SWISS First

> MAKING FULL USE OF THE HEIGHT OF THE CABIN MAY BEAR SOME INTERESTING CONCEPTS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10. Feature lighting and fresh flowers in Cathay's first class
11. Rachel Weisz helped launch the new BA First cabin

developments would be even harder to achieve. For Lufthansa's Bosler, the issue relates more to scale: "Product development costs are relatively high for projects with low quantities. Here, modular standardisation could be a promising way to reduce overall development costs. However, in projects with higher quantities the development costs become less significant."

Swiss Air's Luppi believes that in 10 years' time more basic seating could become completely standardised with premium classes becoming much more luxuriously differentiated and the third dimension of cabin room more fully explored.

Lufthansa's Bosler concurs, if a little more cautiously: "On the one hand, bespoke aircraft interiors exceeding the choice of fabrics and colours will become more relevant for a wider spectrum of airlines, on the other hand the idea of a modular standardisation in certain areas such as economy may become more acceptable even for premium carriers," he says. "I also expect different approaches to the topic of privacy, ranging from complete separation of the individual passenger to a more open space approach. In my opinion, the idea of an exploitation of the third dimension, making full use of the height of a cabin may bear some interesting concepts that will change the look and feel of aircraft interiors considerably."

FINAL FRONTIER As befits a brand linked to space travel, Virgin America's take on the future is wonderfully upbeat: "Whenever we kick off a new design project we ask ourselves what would really amaze our guests, what would really improve our product and what's never been done before," says Jesse McMillin, Virgin America's design director. "I could envision a cabin that would be a seamless link to your everyday life, creating a stylish, functional and inspiring 'pod' that will transport you to your destination while offering you all the things you are accustomed to on the ground."

Virgin America's Bieler expresses it even more succinctly: "I hope that they look nothing like what they do today – and as a new airline known for innovation we fully intend to push that envelope. And by then, we'll have Virgin Galactic flying – so all bets are off, right?"

However Cathay Pacific paints a more down-to-earth picture of life up in the cabin of 2020: "Anyone who tries to predict how anything will look in a decade's time will inevitably be wrong," says McGowan. "But given the fundamentals of aerodynamics, economics and regulatory frameworks, they probably won't look so far removed as we'd like from the interiors of today."

Whatever the future holds, good design made by good design teams – both internal and external – is sure to remain an important part of each brand's overall appeal. ☒

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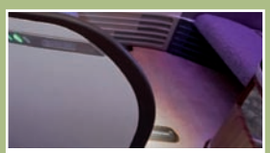

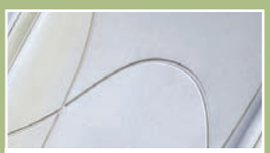

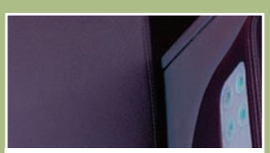

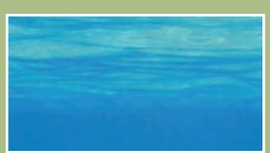

DESIGNSHOWCASE

tradesecrets

Teague's creative director, Paul Wylde, shares his top tips for a stylish, well-integrated interior

01. Boeing SkyLoft concept for the 747-8

In an industry as complex as aviation, experience counts. One of the most established and respected design consultancies in the world, Seattle-based Teague is in a privileged position, having helped define the language of modern flight in collaboration with The Boeing Company and many of the world's leading airlines. During the past six decades Teague has learned a thing or two about aviation design. Here we share some 'softer' learnings – tricks of the trade that make special and memorable cabin experiences, drive competitive advantage and inspire passenger loyalty.

MACRO AND MICRO When creating a cabin interior, think in the 'macro' and then the 'micro' – the macro being the first, all-important impression when entering the space. This first brand declaration sets the expectation for all that is to follow thereafter. The rest of the inflight experience is then focused on the micro. For anything up to 14 hours, the passenger is restricted to an abnormally small space. The tiniest details then become of interest and act as a barometer for the standards of service, company reputation and brand expression.

This subtle balance between first impression and obsession is demonstrated in Teague's recent work with Boeing on SkyLoft – a conceptual project for the 747-8 intended to explore a repurposed upper lobe space for airline brand differentiation and competitive advantage. Although a conceptual study, SkyLoft leverages design techniques from the private jet market: simplification; a sensual and seamless form language; strategic ambient up-lighting; and a neutral materials palette to enhance the feeling of space. The detailing of the furniture, functionality, fixtures and fittings in the space were also considered as an

> SKYLOFT LEVERAGES DESIGN TECHNIQUES FROM THE PRIVATE JET MARKET: A SENSUAL AND SEAMLESS FORM LANGUAGE; AND A NEUTRAL MATERIALS PALETTE

02. Emirates' 777 first-class cabin

integrated element of the architectural language – very often this isn't the case, with new cabin interior elements adopting a different design language to that of the aircraft architecture.

HORIZON UP The most successful cabin architecture reflects a harmonious relationship between the airline brand and the aircraft manufacturer's expressions (the latter being subordinate to the former). Like a great gallery or museum space, it's important to consider the cabin envelope as a platform or blank canvas that fully realises and enables the airline brand's message and expression.

Teague's work with Boeing and Pierrejean Design Studio in collaboration with Emirates is a good example of such a harmonious approach. In the first-class cabin of Emirates' 777s, the passenger is greeted by a distinctive and memorable interior, featuring a 3m-tall ceiling – one of the highest in the air. All unnecessary details and components have been hidden to deliver an understated, seamless and premium environment. The structural lattice framework reworked by Teague's mechanical engineering team

03

04

03. Panasonic's Integrated Smart Monitor
04. InterfaceFlor's modular carpet in service with Southwest Airlines

supports a new lining package that creates a spacious, pure canvas for the airline to express its brand.

The programmable dynamic lighting, including a night-sky 'star' ceiling, redefines the space with its dual functionality of pre-flight premium welcome and inflight destination point, helping Emirates set a new benchmark for long-haul premium air travel.

The entry ceiling dome, which defines the space and improves lighting for display and crew service delivery, has become a modern aviation icon, inspiring a new generation of interiors.

These innovations have additional commercial impact above and beyond the passenger experience. The easy-to-assemble interior lining package (the majority of which can be installed without tools), slashes installation times and cuts costs by reducing the part-count.

ME AND WE Passengers want privacy and comfort – these emotional and functional needs work across brand, culture, product and class. They also want to retain the feeling of space and being connected to a wider community of travellers. Striking the right balance between individual, defendable space while retaining the notion of connectivity and integration with a larger space requires skill and intelligence. Interior architecture, product design, digital communications and user interface design all play a role in responding to the very different needs of travellers at different stages of the journey.

Panasonic's Integrated Smart Monitor, designed by Teague in collaboration with the IFE manufacturer and Weber Aircraft, is a breakthrough in the strategic use of design and its effective management. Panasonic's foresight in integrating its skills in IFE and digital technology, Weber's expertise in seat manufacture and comfort and Teague's capabilities in experiential design at such an early stage has yielded arguably the best economy seat in the world today.

With an infrastructure that allows for personal mobile devices to connect and superior aesthetics, Teague's guiding conceptual principle was to reclaim the back of the seat in front as an individual personal entertainment space within a public space.

DETAILS, DETAILS The tiniest touch-points often provide the interaction moments that leave the biggest and most lasting impressions, representing the quality of the overall experience in a direct and immediate way. It's therefore important that airlines don't forget how things feel – the tactility of touch-points says everything about the health of your brand. The larger and more established your brand, the more crucial the tiniest detail of your touch-points becomes. This truth extends across the cabin, including the items that frankly most passengers choose not to notice. Take a new prototype carpet Teague has helped develop with InterfaceFlor, Boeing and Southwest Airlines. Made from recycled carpet, it is the first modular carpet in the world to reduce waste, raise awareness and improve the passenger experience.

Of course Southwest was one of the first low-cost airlines that inspired start-ups to flourish over a decade ago. It now finds itself leading again in its efforts to become one of the first 'low-carb' airlines.

With the recession finally ending, confidence restoring and airlines almost back to where they were prior to the economic crash, we'll see our industry waking up again, leaning more on design, production and engineering expertise to keep passengers comfortable, happy and loyal – with Teague ready to lend a hand whenever called upon. ☒

about the author

As Teague's newly appointed creative director, Paul Wylde is responsible for leading and creatively directing Teague's aviation studio. In this role, he oversees an exceptional team of talent known for creating provocative, innovative and powerful design work. With nearly 15 years' experience, Paul has worked with some of the world's leading brands including Airbus, Johnson & Johnson, Proctor & Gamble, Microsoft, Roche, Halfords, Tesco and Thomas Cook among others. Prior to joining Teague, Paul held numerous leadership positions within the design industry including: creative director of New York City-based Imagination; creative director of the Advanced Communications and Concepts team of BMW Group Designworks USA; and brand guardian of British Airways. As a brand consultant he worked with Interbrand, The Nest and the BBC. A regular presenter and lecturer, Paul speaks on the topics of design management, corporate identity and branding at events and conferences across the globe. He has appeared on BBC2 and Dutch television and is a visiting lecturer at The London School of Marketing, Central Saint Martins School of Art and London Metropolitan University.

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privatelives

Ian Dryburgh of Acumen Design Associates asks if there is a more sophisticated, weight-efficient and attractive approach to providing onboard personal privacy

01. Korean Air's Kosmo Suite

Since the launch of British Airways' ground-breaking 'Bed in The Sky' in 1996, the need to enhance privacy for sleeping passengers whilst retaining the prospect of socialising has proved to be a significant challenge for airlines, designers and seat manufacturers alike. Prior to BA's introduction of First, full-height bulkheads or semi-rigid structures were used to define different cabin classes, reinforcing social divisions – all very British! However, with more and more international carriers now offering lie-flat beds in first- and business-class as standard, it has also become a pre-requisite to provide additional privacy between individual seats.

OWN THE SPACE Clear ownership of personal space has become an increasingly important issue with passengers, many of whom are willing to pay a premium to secure it. Personal space is defined as "an area with invisible boundaries that surrounds us" and "a protective buffer zone that allows one to maintain a sense of privacy and to control the amount of stimulation one receives during interaction with another person".

How to create appropriate levels of flexible privacy that avoid creating a sense of claustrophobia has generated a fascinating variety of conceptual approaches – although in some cases the end result has been somewhat compromised. After all, one passenger's

> CLEAR OWNERSHIP OF PERSONAL SPACE HAS BECOME AN INCREASINGLY IMPORTANT ISSUE WITH PASSENGERS

02

idea of privacy may leave another feeling a little trapped. Cultural differences add to the challenge, ensuring a complex debate that demands a sensitive response. It is apparent that a sense of 'belonging' within the greater cabin environment without a feeling of intrusion from fellow travellers needs to be retained. There is always the risk that an overly heavy-handed approach could create a sense of isolation and confinement.

The degree of privacy provided for each class of passenger has become a point of differentiation between carriers. Airlines know that exclusivity and status are linked to not only the perceived ownership of personal space, but the degree of certainty that privacy is assured. With the introduction of showers, guest dining and passengers changing into sleeper suits, the desire for privacy has never been greater, fostering more 'closed' communities.

For an airline to determine the appropriate level of privacy for each class of traveller is a challenge, made even harder when you overlay national and cultural preconceptions as to what constitutes an acceptable level of privacy. In the US, where the nature of

02. Cathay Pacific first-class suite

03. The outboard-facing layout of Cathay's suites enhances the feeling of privacy for passengers
04. Delta's new Business Elite cabin

society is generally more gregarious and egalitarian, they tend to take a less structured approach to the 'social divide', whereas more hierarchical societies, such as those found in Asia and the Middle East, have a greater need for physical screening between passengers rather than mere 'perceived' exclusivity.

RIGHT FOR EACH AIRLINE As a design consultancy that has led the march in creating premium cabins for many of the world's airlines, Acumen has been obliged to create ever more sophisticated solutions that provide the requisite levels of privacy in keeping with an airline's cultural identity. For example, Korean Airlines challenged Acumen to create a new first-class suite that retained an open feel to the cabin on boarding and during daytime flight. However the product includes electrically raised privacy shrouds, which transform the suite into a private bedroom environment at the press of a button, as desired. The Kosmo Suite has proven a great success with the airline's passengers and illustrates a refreshing alternative to simply providing a 'boxed' structure around a space.

Perceived privacy is a particularly subjective issue as it involves a range of issues including acoustic isolation, light pollution, scale of surroundings and lines of sight. Any sense of invasion of personal space can lead to discomfort, anger or anxiety on the part of the passenger. In particular, passengers can become stressed if they lose their line of sight with cabin crew and fellow passengers. By adopting a more sophisticated approach to seat configuration – as with Cathay Pacific's new first-class suites employed in an outboard-facing herringbone layout – it is possible to achieve high privacy levels, whilst retaining sight lines, as well as a feeling of 'cocooned' well-being.

TRIAL AND ERROR The use of qualitative research with full-size mock-ups and a wide range of respondents as early as possible in the design process is the most effective way to resolve the highly sensitive issue of personal space. By trialling a range of possible screening solutions and seating configurations with customers of differing physiological profiles, the optimal shapes, positions and amount of screening required soon becomes apparent.

A common concern with passengers is to eliminate light pollution from adjacent monitors. The more progressive seat configurations where seats are staggered or angled seem to provide the best opportunities to eliminate or significantly reduce this problem. Delta's recently announced Business Elite for its B747s provides a good illustration of heightened privacy by virtue of its herringbone configuration, while also addressing monitor light pollution. The introduction of acoustic shielding into the seat and bed shroud could further enhance a sense of detachment from the immediate surroundings through sound attenuation.

The problem of personal space is even more acute when one considers the spatial constraints of a typical business-class cabin. With seating components being so tightly packaged, it is especially challenging to offer flexible and effective screening solutions between passengers. It can be quite awkward for passengers to blank-out the person sitting next to them both physically and socially in a shared screened environment. However, with Contour's B787 catalogue product 'Aura', the armrest doubles as a raised privacy divide offering an interesting multifunctional solution. The use of transparent screening materials such as PPSU and Makrolon are now allowing designers to realise ever more imaginative screening solutions.

THE FINAL FRONTIER The greatest challenge of all is to create a feeling of privacy and ownership of space within the close confines of an economy-class cabin. A more radical approach from designers must surely be needed if this problem is ever to be resolved.

Fixed-backshell seating certainly reduces the feeling of encroachment on personal space but tends to come with a weight penalty. The design of headrests and profiling of ears can create a feeling of separation between in-line passengers, although a staggered seating arrangement can also produce a similar effect. Another way forward could be to create flex zones or sub-divisions of the economy cabin that are more attuned to individual passenger needs.

In the future perhaps designers might draw more inspiration from alternative approaches from the retail and hospitality markets, where zones have been successfully defined within larger environments. Particular attention to the use of lighting, acoustic materials and fabrics is an essential ingredient. An illustration of such an approach is Etihad's first-class lounge at London-Heathrow, which successfully divides an open space into zones of privacy in sympathy with differing activities.

In our private lives a measure of control over the degree of privacy we enjoy is a given. Meeting those expectations in flight will no doubt continue to provide both a challenge and an exciting opportunity for those airlines and design firms prepared to 'think outside the box'. ☒

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onwardsandupwards

Pierrejean Design Studio's attempts to push the boundaries of both design and certification have resulted in some truly innovative concepts – but it hasn't always been easy!

Pierrejean Design Studio has worked for a long time with prestigious airlines such as Emirates, Qatar Airways and Etihad. The design studio says it is as focused on maintenance and costs as it is on sharp innovative ideas.

Over the past few years the company has been involved in various aircraft projects, where the aim has been to enhance and customise the cabin in line with the airline's brand and passenger expectations.

MINI SUITE In 1998 the company created the first-class Mini Suite for Emirates' A340-500. A totally new concept, the Mini Suite represented a real challenge for engineers, and also in terms of aeronautical regulations. For example, the studio had to redesign a new ceiling architecture to reduce the impact on air flow distribution and to prevent any claustrophobic feelings.

The lighting was also rethought for long flights on this new aircraft. With the aim of minimising jetlag, various moodlighting scenarios were created to suit the natural cycles of the life on board, and also linked with the inflight service. To minimise the number of switches needed, a digital touchscreen hand control was developed.

"To achieve such a project was not simple – some aeronautical certifications written a long time ago had to be modified and updated in accordance with new technologies installed aboard," says Jaques Pierrejean, director of Pierrejean Design Studio. "This innovation not only impacted on Emirates' first-class passengers, but on the entire airline market."

The company was also selected by Etihad to design its first-class product, and produced a full-flat bed seat for business class. At the same time, the studio developed an economy-class concept with a fixed shell, which was shown at the 2008 Aircraft Interiors Expo in Hamburg, Germany.

A380 DESIGNS Always looking for new ideas, the studio was contacted once again by Emirates to work on its A380 programme. "When we first discovered the aircraft, we tried to follow the branding of Airbus and proposed a cinema, a walkway… but we were immediately stopped by a lack of space because of the huge number of seats onboard," says Pierrejean. "We then focused our creativity on 'dead' areas such as the front part of the upper deck, or between two doors. The

> TO ACHIEVE SUCH A PROJECT WAS NOT SIMPLE – SOME AERONAUTICAL CERTIFICATIONS WRITTEN A LONG TIME AGO HAD TO BE MODIFIED AND UPDATED

01. A cabin concept created for ANA

concept of a convivial bar/lounge was a big success, flying most of the time with almost 30 passengers spending a good time around the horseshoe bar. Likewise, the spa with a real shower is now considered a reference for a first-class passenger wishing to look fresh after more than eight hours in flight."

The studio was also looking forward to working on the A380 for Lufthansa. The concept was to provide the passenger with different ways to enjoy the first-class cabin, with a swivelling seat and a separated bed. "This study represented a lot of advantages for the passenger, providing intimacy or conviviality, according to the passenger's mood – with two areas where the passenger could find a bed to sleep in at his convenience, and an open area to stretch his legs and enjoy the company of other passengers," says Pierrejean.

In economy class, special care was dedicated to families travelling with children, allocating space for playing groups of different ages. The concept also paid attention to the spaces around the galley areas – trying to combine these places into social areas and duty-free displays.

In the end the project was not selected. "This is part of the game," says Pierrejean. "We sometimes take the challenge too far considering the customer's expectations, but our brand is to think in terms of innovation, not quantity of work for business."

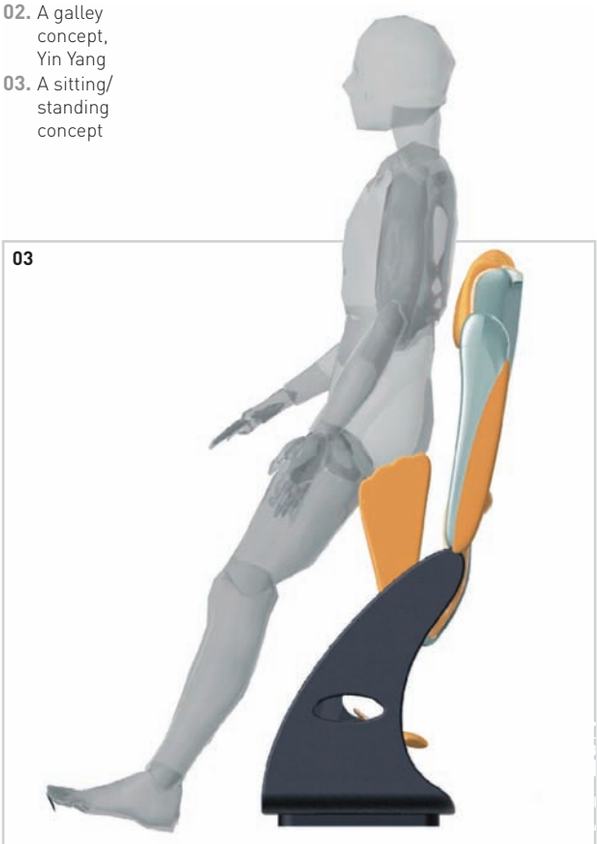
But it is not just premium airlines that have chosen Pierrejean Design Studio. The company has, for instance, developed a very creative cabin concept for Air Mauritius. "The airline wished to upgrade its position on the international market with a very low budget," says Pierrejean. "We accepted the work and we designed a simple and nice cabin concept giving the passengers the feeling of an island in the sky. A lot of research in economy class was applied and the airline brand has developed its new identity around this concept."

BRANCHING OUT One of the studio's current projects is the B787 Dreamliner for Qatar Airways, which is set to be revealed in 2011. But besides design concepts for airlines, the studio also creates new products for various manufacturers – including lighting, seat, galley and lavatory concepts and customisation. One of these projects is a new economy-class seat, designed for families flying together.

The studio has also been involved in new architectural concepts for both

> THE FULL SUPPORT OF TOP AIRLINES HAS HELPED US A GREAT DEAL TO CONVINCE THE AUTHORITIES TO GO AHEAD

02. A galley concept, Yin Yang
03. A sitting/ standing concept



Boeing and Airbus cabins. "Based on the current configuration, we tried to emphasise space onboard with a completely new lining," says Pierrejean. "To achieve such a project, we had to work in close collaboration with these two companies and their design offices."

PRIVATE AIRCRAFT The studio also has a lot of experience in private aircraft. As well as designing the Airbus Corporate Jet (ACJ) commercial mock-up for Airbus, the company has worked on most aircraft types available on the market. It says this experience feeds into its work with airlines. "The aeronautical regulations are extremely strict nowadays and it is getting harder to totally fulfil our wishes in terms of innovation," says Pierrejean. "Our great advantage is to consider some private aircraft as laboratories where new concepts can be developed and applied later in airline cabins."

Most of the company's projects do not involve simply placing a seat somewhere in the cabin. The company focuses on creating a complete environment around the seat, a kind of cocoon incorporating an original lighting concept, upgraded airflow distribution and so on. At times this has meant pushing hard for evolution in aircraft regulations, for the benefit of both passengers and airlines. "We must admit that the full support of top airlines has helped us a great deal to convince the authorities to go ahead and allow the installation of totally new concepts such as the Mini Suites, a waterfall or a real spa/shower as we did for Emirates," says Pierrejean. "How do you certify something that has never been done before? By creating new international regulations."

But the company has faced some frustrations in its quest to push the boundaries. "We supposed we were a little bit too innovative for Etihad when we proposed a new notion of onboard service using one space for both first and business classes. This would've enabled the crew to concentrate all functions in one specific area, providing more space for the passenger lounge," says Pierrejean. "Unfortunately, this kind of mini revolution has to be shared by all, and also required extra crew training. The project was abandoned by the company."

Another forward-thinking idea was a new way of travelling in a sitting/ standing position, to enable the installation of more economy seats onboard. It was aimed at the Chinese market. "We had noticed, for instance, that Asian people often travelled by train, which is less expensive than aircraft," says Pierrejean. "Our concept was to offer them a cheaper trip on two- or three-hour flights. Their journey time would be reduced ten times for the same price."

The idea was to create a new market in booming countries with many potential travellers, but unfortunately it was seen as a step too far for some.

"Again, to achieve such things we need the full support of powerful airlines buying a lot of aircraft, and therefore in a position to convince, during negotiations, the aircraft manufacturers to study all the impacts on the cabin installation," says Pierrejean. "The paradox is that it is easier to make these projects accepted when the competition is hard between companies rather than during time of calm business."

ENGINEERING AND ART The studio sees its work as something between engineering and art, and there are many different aspects and parties to consider. "Despite the fact that Airbus and Boeing would like product standardisation on their new aircraft, it is the wish of many companies to differentiate themselves from their competitors, to promote their own identity and brand, and to offer a personalised inflight service," says Pierrejean. "Our job is create a link between them and propose challenging, creative ideas that also stand up in terms of durability, maintenance and certifications – for everyone's satisfaction! Our target is to keep ahead on innovations, to be aware of the latest technologies, to promote new product developments with manufacturers and vendors, and to give the best of our experience to our clients." ☒

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PCU touchscreen

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space lounge
waterfall feature

2004 Emirates cabin

New lining architecture

B777EX

2005 Pearl B/C seat

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bigpicture

Priestmangoode believes in designing seamless travel experiences – the design firm is currently working with Turkish Airlines on all aspects of its brand

01. Lufthansa's A380 first-class cabin
02. Priestmangoode is working with Turkish Airlines on everything from its logo and livery to uniforms, check-in desks and interiors, of course

"The future of air travel is about transforming the complete passenger journey into a seamless branded experience from home to destination," says Nigel Goode, founding director of London-based design firm, Priestmangoode. "We've been delivering award-winning cabin interior designs to airlines for many years now, helping them to create exceptional onboard experiences. We believe there's still an opportunity to work with an airline to extend its brand to the whole passenger experience and think we are well placed to do this."

In response, the design agency has launched a more comprehensive service that goes beyond designing seating and monuments to include corporate identity, onboard hospitality, ground services, livery and uniforms. "We understand how the brand communicates with the passenger and we believe we can change the perception of an airline by designing the experience from home to destination," continues Goode. "Where corporate identity companies deal with the intangible elements of what a brand makes the consumer feel, we are skilled in delivering the tangible experience, understanding what the passenger wants and when they want it. By approaching the brand from the user perspective and developing cabin interiors in conjunction with cabin staff, we develop products that are more effective in service. It's a natural extension of our offer, and we have a number of projects, illustrating what we can do in this area. We believe there is more scope for us to deliver a total brand experience that will redefine the expectations of air travel," says Goode. "We don't just design airline cabin interiors, we transform businesses by developing exceptional passenger experiences."

LUFTHANSA Priestmangoode worked with Lufthansa on the design of the German carrier's new flagship A380, which launched in June this year. The design firm worked on the interiors across all three classes, including its stunning new first-class cabin, which brings the comfort and quality of Lufthansa's First Class Terminal in Frankfurt on board the aircraft. Lufthansa plans to retrofit a similar product across its entire long-haul fleet, starting with its A330s and A340s at the beginning of 2011.

"We have spent the best part of 10 years working with Lufthansa on the refinement of their brand and product detailing," says Luke Hawes, director, Priestmangoode. "The A380 embodies the values that Lufthansa hold true – not only producing a great looking product but one which has amazing attention to detail and technical prowess."

> WE FOCUSED ON DELIVERING A HOLISTIC BRAND EXPERIENCE ON BOARD BY MAPPING OUT THE PASSENGER JOURNEY FROM CHECK-IN TO AIRCRAFT

03. SWISS first-class seat control unit and GUI

Employing the same palette of leather, suede, wood and marble-like laminate in caramel, champagne, chablis, and grey-brown used in Lufthansa's First Class Terminal, the new first-class cabin feels warmer and more domestic, providing a seamless transition between airport lounge and aircraft. The famous Lufthansa logo has also been re-interpreted for first class with a matt-white relief crane on a gloss white background.

Priestmangoode also designed the business and economy cabins for Lufthansa's A380 fleet. Business-class seating, located on the upper deck of the aircraft, has been upgraded to offer full-length, high-comfort beds at an angle. The corporate Lufthansa colour scheme of silver and blue with yellow detailing is used throughout the cabin. The branding panel has also been redesigned with an aluminium crane on a high-gloss blue background.

The new economy seats feature slimmer seat back shells helping to maximise living space. The visual impact of the grey, blue and yellow colour scheme is enhanced with a cabin brand panel featuring a yellow crane on an anthracite background.

SWISS Priestmangoode also helped craft the award-winning SWISS first-class suite that has been in service with the European carrier since 2009. Goode says the suite offers a design that is "relaxed but exact" in terms of its detail and quality of materials. The spacious surroundings of the suite and adjustable sidewalls provide privacy, while sophisticated lighting and contemporary design combine to create a calm and luxurious space.

The seat can be adjusted at the touch of a button to individual passenger requirements, with intuitive features allowing control of the space without any sense of being overwhelmed by technology. A bespoke controller, designed by Priestmangoode, allows passengers to adjust the seat, privacy screens and lighting.

"As a starting point, we looked at the recognisably Swiss traits of traditionally under-stated design delivered with a lightness of touch, precise craftsmanship and attention to detail," explains Goode. "We focused on delivering a holistic brand experience on board by mapping out the passenger journey from check-in to aircraft. The new SWISS first-class suite has been delivered with simplicity and quality at the heart of its design."

TURKISH AIRLINES The design firm is currently working with Turkish Airlines, implementing new interiors across its

planes, trains and... hotels

In 2008, Priestmangoode won a long-term contract in collaboration with Sifang to design high-speed trains for China and the rest of the world. Aviation clients include Airbus, Embraer, Lufthansa, Malaysia Airlines, Turkish Airlines, Kingfisher and TAM. Priestmangoode's long experience of creating value from design in luxury transport interiors led to an award-winning project to develop a cost-effective budget hotel room for Accor's ETAP and Motel 6 brands. The design agency's innovative space-saving designs are currently being rolled out across the entire global portfolios of each hotel brand.

entire fleet, as well as redesigning its ground services, lounges and check-in counters to create a total passenger journey from check-in to destination.

The decision to launch a total brand redesign is a key tool in the airline's marketing strategy it embarks upon a major expansion programme – it currently has orders for 105 aircraft. With its new brand promise, 'Globally Yours', Turkish Airlines is perfectly positioned to maximise its unique location as the hub between East and West. Priestmangoode is developing a complete interior design scheme for the new Boeing 777s that will join the airline's wide-body fleet between the end of 2010 and 2011, as well as for its new A330s that will join between the end of 2010 and 2012. The design firm is also developing interiors for its new narrow-body fleet, including A319-100s, A321-200s, B737-800s and B737-900ERs. The new cabin products will be simultaneously retrofitted across the entire fleet.

Meanwhile the design agency's ground service projects will help define

04. Kingfisher airport lounge
05. Kingfisher onboard bar

key brand messages for Turkish Airlines through signature colours, finishes and materials, as well as creating a clear link between the cabin interiors and the entire passenger experience through the airport terminal. Priestmangoode is also consulting on the airline's livery as part of the contract in partnership with a local graphic design agency.

"This is a perfect project for us," says Hawes. "Turkish Airlines sees the rebrand as an opportunity to raise the quality of its offer right across its fleet and position itself directly against the other major European carriers. Our experience of creating total brand environments is exactly what it needs to develop a really strong message for its customers. Through our long experience of working in the airline sector, and our recent work to design all the internal environment products at London-Heathrow's Terminal 5, we know that it's the branded customer experience that matters."

KINGFISHER Kingfisher Airlines charged Priestmangoode with the task of designing the interiors of its new A330s and A340s, which provide international service to the USA and UK. "Kingfisher was committed to creating a lifestyle experience on board as an extension of the Kingfisher beer brand," explains Goode. Kingfisher First features spacious and comfortable lie-flat beds, as well as a social area with a bar and break-out seating and starry skies. The design also facilitates an 'anytime dining' service, offering an unprecedented freedom of movement and choice. In Kingfisher Class, extra wide seats and spacious leg-room reinforce the focus on the 'guest' rather than the passenger, recognising Kingfisher's five-star airline status. This 'home-to-destination' experience extends through to the airport lounge.

PROFITABLE VENTURE "In times of austerity, passengers want to know that they are travelling with brands that will guarantee them not only value for money but importantly a decent experience," asserts Goode. "Delivering a brand experience that is coherent in all aspects is an efficient way of guaranteeing a return on an airline's marketing spend," he continues. "Aircraft interior designers can lead the way in showing that design can completely revolutionise the perception of an airline, delivering more repeat business and ultimately more profit." ☒

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branding the whole experience

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holidayheaven

Sun, sea and the sexy new 787 – Honour Branding is working with Thomson Airways to deliver a holiday-themed onboard experience for its Dreamliner fleet

01. Honour and Thomson Airways have fashioned a 'beach bar' monument for the 787 entrance area

Thomson, one of the best-known travel brands in the UK, is firmly focused on redefining the package holiday by offering the best holidays in the marketplace. Its current marketing campaign, 'Holidays built with you in mind', clearly reflects its business strategy of placing the customer at the heart of everything it does. So when Thomson Airways approached Honour Branding to design and specify the cabin and future onboard experience for its new Boeing 787 fleet, it demanded the same customer-focused approach to further enhance the already strong selling points of the 787's innovative interior.

ROUTE FINDER Honour was initially asked to work in collaboration with the airline's marketing communications agency, Beattie McGuinness Bungay (BMB), which identified three key directions, each embracing a different customer insight about flying and going on holiday, for the new brand experience on Thomson Airways' B787 aircraft. The first, 'connecting to the sky', focused on how flying in the most advanced passenger aircraft in the world could inspire passengers to rediscover the wonder of flight. The second, 'holiday well-being', emphasised how the 787's advanced technology is designed to enclose passengers in a more comfortable, natural environment, ensuring they arrive feeling more refreshed. The third, 'exotic beach bliss' was designed to ensure the customer's far-away holiday started as soon as they stepped onto the B787. Thomson then researched these ideas further to see which one captured its customers' needs and aspirations the most. 'Holiday well-being' was eventually chosen as this was seen to encapsulate the emotional benefits of taking a holiday, with the physical benefits of the new Dreamliner fleet.

Honour then took the lead role in developing a creative strategy for the new cabin interior and customer experience. Its initial concept work interpreted a sense of well-being into two creative directions inspired by spa holidays and hotels – 'Beach Spa' and 'Lush Tropical Spa'. Both used visual elements to enhance a feeling of well-being in the cabin environment. Lush Tropical Spa captured the fresh green and natural elements of a rainforest spa retreat, whilst the Beach Spa took more of its inspiration from an exclusive island spa resort.

The design agency then set about generating a number of colour, fabric and texture boards. The first stage

> THE HOLIDAY THEME WAS FURTHER ENHANCED WITH CONCEPTS FOR BEACH TOWEL 'BLANKETS' TO INJECT AN ELEMENT OF COLOUR INTO THE CABIN

culminated in a sensorial presentation of concepts, material samples, food service concepts and even the use of scent to bring the cabin experience alive. Several inspirational mood boards were created to give direction on colour, texture and images – for example, Beach Spa blended ocean hues with sun-bleached neutrals.

The Beach Spa visual approach was chosen as the preferred creative route as it resonated more with the Thomson brand colour palette. The development of fabric and material samples with various mills, suppliers and Boeing's in-house designers at Teague followed, with different colour ways and options tested. Fabrics ranged from lush jungle leaf patterns, to pastel coral reefs and vibrant tropical fish, through to Cote D'Azur-inspired beach stripes. One fabric featured a repeated flip-flop pattern design to add a twist of holiday fun!

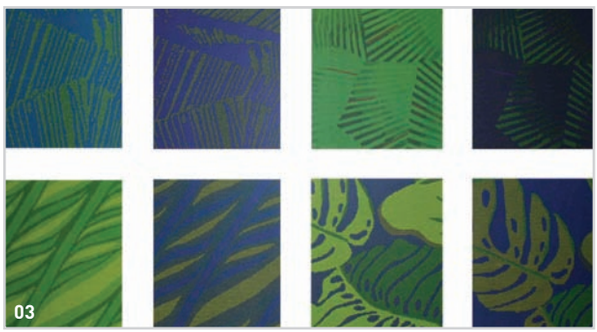
Eventually Thomson chose a sun-bleached, sand-coloured leather as the seat material to give the overall cabin a premium feel, while some of the earlier fabric designs were used for curtains and blanket development. Several carpet designs were developed using inspiration from coir and seagrass rugs, which are used extensively within spa environments because of their natural handwoven texture. However for practical reasons a dappled 'ocean blue' colour was chosen to balance against the light sand colour of the leather.

TRIED AND TESTED Throughout the design development stage, Honour was able to visit the 787 Gallery in Seattle with the Thomson management team to evaluate various design options. This enabled Honour to hold progress review meetings with Teague to ensure all SFE and BFE material and finishes were specified correctly. It also enabled the review of material colours within the cabin mock-up under the many different lighting scenarios that the aircraft has to offer.

The holiday theme was further enhanced with concepts for beach towel 'blankets' to inject an element of colour into the cabin, while white cotton waffle cushions give a 'spa' feeling of cleanliness and calm.

A feeling of tranquility was added through the development of decorative laminates for the bulkheads and monuments that feature natural patterns created using the shadows of palm trees and beach grasses. The laminates work in perfect harmony with the various lighting effects on the aircraft from dawn to sunset. They also provide an instantly recognisable,

02. Ocean hues and sun-bleached neutrals helped inspire colour and material choices



03

04

03. Fabric concept development featuring tropical leaves
04. 'Palm tree shadow' laminates are used on bulkheads to reinforce the holiday theme
05. Flooring concept for the bathroom

05

Thomson Airways

Thomson Airways, formed by the merger of Thomsonfly and First Choice Airways in November 2008, is the UK's third largest airline. It provides flights for Thomson or First Choice holiday customers, as well as those wanting flight-only seats. In July 2010, the airline announced plans to transform long-haul travel for its passengers as the first UK airline customer for the Boeing 787 Dreamliner. It will take delivery of its first 787 in January 2012, followed by a further seven aircraft. TUI Travel PLC, Europe's leading travel company and parent company of Thomson Airways, is taking a further five, boosting the group's tally to 13 aircraft in total.

iconic beach holiday scene that is both relaxing and reflective.

The subtle 'shadow' laminate design is taken further onto the lavatory walls to provide a natural softening to the hard plastic surfaces. Natural warm white colour tones and warm, stone-coloured counter top finishes were chosen for the lavatories sinks and cabinetry. The bathroom flooring material enabled Honour to explore a number of creative ideas using a photo-graphic printing approach. Its concepts ranged from teak wooden boardwalk flooring, through to soft white pebbles on a beach and aqua blue mosaic tiles seen through rippling swimming pool water. An element of fun was injected into the lavatory design through the use of images of footsteps in the sand –raising a smile on everyone's face when the concept was first presented.

BEACH BAR With a remit to take the 'holiday well-being' positioning further, Honour's presentations included ideas for onboard service and meal tray designs. Thomson has taken the opportunity offered by a new aircraft to incorporate a credenza unit within the cabin environment. Called the Beach Bar, it features a decorative laminate design of bamboo reeds to represent a friendly local bar on the beach. This creates a perfect space to provide holiday cocktails and exotic smoothies. It also plays an important well-being role in providing a destination on board for passengers to stretch their legs during a long-haul flight.

A variety of meal tray design concepts were also developed for the airline, embracing bleached wood-effect trays, shell-shaped dishes and starfish-inspired salt and pepper pots – all aimed at creating a unique and compelling experience for the customer. A secondary meal concept was also suggested, designed around a 'beach picnic', featuring a hamper-inspired snack box with healthy treats and snacks to sustain passengers through the journey.

The design process concluded with the preparation of a specification manual detailing all the materials and finishes chosen for the aircraft. This coincided with meeting Boeing's requirements and input into its Customer Concurrence Definition (CCD) process to define the final specification for Thomson's new fleet.

LESSONS LEARNED Through this exciting work with Thomson, Honour has built up extensive knowledge and experience of designing and specifiying the interior of the B787. "We always take a holistic approach to the creation of brand experiences by ensuring that the visual language of the brand works across every customer touch point," says Honour's Mike Crump. "Honour believes that the unique environmental and customer benefits of the new Boeing 787 give an interesting opportunity for many airlines to create a compelling statement about their brand," he continues. "Thomson has taken one of the first bold steps to embrace these points of difference and integrate them into its own brand philosophy and develop a truly integrated customer proposition."

Thomson Airways continues to work with Honour to develop and modify the concepts ahead of its launch in January 2012. ☒

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'The Great British Lounge', bmi's International Lounge at Heathrow Terminal I, launched June 2009 - designed by Honour.
Photo courtesy of bmi

HONOUR

quickthinking

A tale of two worlds a decade apart: Factorydesign's focus on efficiency for Concorde provided the ideal background when tasked with an interior for low-cost carrier Jet2.com

01. Redesigned interior for Concorde from Factorydesign

Once upon a time there was a supersonic airliner called Concorde. It was an aircraft of extremes, born from a collaboration between France and the United Kingdom. The legacy of this union can still be seen today – the Airbus A380.

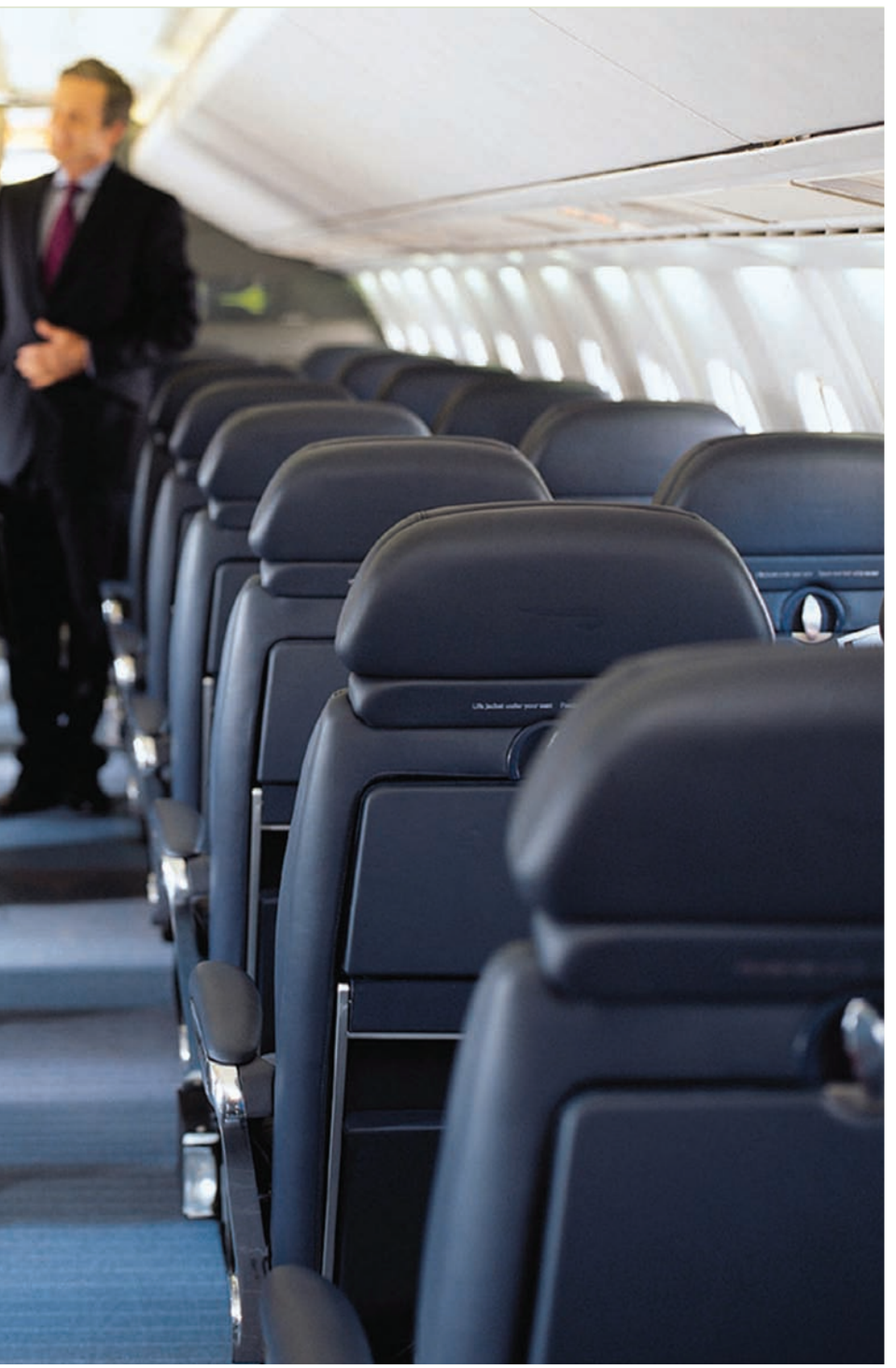
When designing any commercial aircraft interior there are always common ambitions, from ensuring enough seats to please the revenue managers, to cramming in the correct cart/pax ratios to serve food – in the service style – to suit the client's brand offer. However, during our work for Concorde, our defining mantra was thus: 'Lightness is next to Godliness'. A decade later, we found ourselves obsessing over the same issue when engaged by a low-cost carrier, as well as striving to ensure every part performed both a technical and visual function.

ROCKET SCIENCE

It should be remembered Concorde really was faster than a speeding bullet, flying in space so high you could see the curve of the earth, stretching 9in during flight and taking passengers across the Atlantic faster than ever before – and ever since. In February 1996, British Airways G-BOAD flew from London Heathrow to New York JFKin just 2 hours, 52 minutes and 59 seconds.

Nicknamed The Rocket by British Airways staff, Concorde was initially intended to be a mainstream passenger jet, designed to fly travellers around the world faster than any other aircraft. A victim of politics, bad timing (the arrival of the Boeing 747) and circumstance (the failure of the Tupolev TU 144), Concorde instead became the ultimate in VIP transportation. Not business class, not first class, not even super first class – its extraordinary speed provided the foundation for an exclusive, prestigious, unique experience that could not be replicated any other way.

> IT SHOULD BE REMEMBERED THAT CONCORDE REALLY WAS FASTER THAN A SPEEDING BULLET, FLYING IN SPACE SO HIGH YOU COULD SEE THE CURVE OF THE EARTH



02. Superlight R economy seat from Acro Aircraft Seating

light relief

The Superlight F economy seat from Acro Aircraft Seating weighs 30kg per triple and developments are under way to make it even lighter. The unique backrest design gives passengers more legroom at a typical pitch, which should satisfy the number crunchers. Meanwhile the engineering department benefits from only 60 parts per triple on this EASA 16*g* certified seat. Acro has recently launched a recline version, the Superlight R, with all the same comfort, maintainability and light weight.

British Airways' fleet grew to include seven Concorde jets. Even as these astonishing aircraft aged, the airline recognised that its fleet had over a decade of airworthiness and profitability still to offer. So in 1999, it commissioned Factorydesign to improve the experience for passengers. Having more in common with a private business jet than a commercial airliner, this was a unique transport design project.

OUTSIDE IN Factorydesign undertook the innovative redesign of the interior, including seating, galleys and lavatories, to update, streamline and enhance the overall ambience of the cabin interior. The brand ambition was established

> CAREFUL PROFILIING OF THE BACKREST PROVIDES PASSENGERS WITH MORE LEGROOM

03. Jet2.com seating from Acro Aircraft Seating and Factorydesign
04. The Superlight seat weighs just 30kg per triple


03


04

letters to the minister

Initially referred to in the UK as Concorde with the French spelling, the name was changed to Concord by Harold Macmillan after a perceived slight by Charles de Gaulle. In 1967, the then British Minister for Technology, Tony Benn, changed the spelling back to Concorde, in the process creating uproar that only passed when he stated that the 'e' represented 'excellence, England, Europe and entente cordiale'. In his memoirs, Benn recalls a letter from an irate Scotsman who was unhappy about the 'e' being added to represent England – as part of the aircraft was made in Scotland. Benn's reply? "The 'e' is also for Écosse!"

simply as "to bring the elegance of the outside of the aircraft inside". To achieve this, new washrooms were treated with product design details consistent with luxury hotels and new seats were designed to be lighter, more elegant and more comfortable. And to mark the aircraft passing Mach 1 (in the absence of any detectable sonic boom on board), an ingenious pulse of blue light was created to alert the passenger to the moment the sound barrier was broken.

The design process followed the usual format: from idea generation, through to concept design, refinement and the production of a full-size mock up, and on to the critical design review. Beyond the development of new seats, galleys and lavatories, Factorydesign also supported British Airways' design management team with additional project management.

Circumstance again conspired against Concorde when the tragedy of the Air France crash meant additional fuel tank linings had to be fitted to every aircraft. Fortunately a new, lighter aircraft seat design enabled British Airways to maintain the same LOPA and passenger count despite the additional weight of the fuel tanks. Beyond ensuring that each seat component part functioned correctly and looked elegant, we also ensured that no additional parts (adding weight) were required to cover the seats for decorative purposes. This, and the introduction of a monocoque carbon fibre seatback and base that enabled the seat to recline around a single pivot point, created a vastly lighter seat, compensating for the additional weight of the redesigned fuel tanks. The inspirational detailing provided a physical connection between brand and product, providing a consistent design language and continuity in brand communication. While privileged to have contributed to her story, we mourn her retirement.

SUPERLIGHT SEAT Nearly a decade later, by adopting the same design principles of simplicity, function and elegance, Factorydesign has developed a new seat for Acro Aircraft Seating called Superlight, designed specifically for single-aisle aircraft and the lightest seat in its class. Careful profiling of the backrest provides passengers with more legroom than a standard economy-class unit. Superlight is currently flying with Jet2.com on its B737 and B757 fleets, providing passengers with an improved experience and sense of well-being in what can be the harsh end of the airline travel market.

Despite being separated by 10 years and sitting at different ends of the brand and customer spectrum, the Concorde Speedmarque and Acro Superlight seats have much in common, with both born from a shared design philosophy. Both feature a fixed seat back and seat base relationship; both have carefully contoured back rests to ensure maximum knee space; and both are covered in leather (though time and technology have provided the innovation of E-Leather for the latter). Both feature elegant as well as functional components; and suffice to say both are very light.

Whether you are an international carrier looking to offer the most prestigious flying experience ever or a low-cost carrier flying large numbers of passengers on their holidays, both can benefit from intelligent, thoughtful and innovative design creativity. And so can their passengers. ☒

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comfortzone

Could the same creative design process behind a number of innovative business-class seats deliver a new generation of economy seating, asks James Park Associates (JPA)?

01. JPA's reverse-herringbone suite, in service with US Airways

"Sitting in one place for hours on end in dismal surroundings is a recipe for boredom, restlessness and frustration," says James Park, managing director of JPA. "While great new products have been developed for premium passengers, economy travel can be more of a trial than a pleasure. The challenge for designers and airlines alike is to reintroduce the same sense of style and excitement to the rear of the aircraft that you now tend to only find at the front," he continues. "Well-designed aircraft cabins and seating that provide comfort, space and amenity can transform the passenger experience, make flying a pleasure again and build repeat business. The argument that comfort means lost revenue is a mistaken one and the model that has been applied to business-class cabins can be applied to economy just as successfully."

REVERSE GEAR One example of this approach to business-class seating is JPA's recent reverse-herringbone suite. Utilising a 1-2-1 configuration, every passenger benefits from direct aisle access and the away-from-the-aisle layout ensures that both privacy and living area are protected. The pitch can be varied from 43in upwards, depending on passenger density requirements, while colour and trim and surrounding furniture can also be customised to a range of specifications. Furthermore, the suite's use of lightweight materials and its unpalletised design ensure weight savings of between 20-30 lb per suite.

For the passenger, the reverse-herringbone configuration means an end to being jostled by in-service trolleys, while customers travelling together in central pairs are angled towards each other and can socialise more easily. Retractable screens ensure extra privacy when it is required and the extra-wide centre console provides additional

> THE ARGUMENT THAT COMFORT MEANS LOST REVENUE IS A MISTAKEN ONE – THE MODEL THAT HAS BEEN APPLIED TO BUSINESS CLASS CAN BE APPLIED TO ECONOMY

room service

Since its launch in 1982, JPA has built a reputation for designing high-quality, premium interiors for the aviation and hotel sectors. "With both hotels and premium air travel," says James Park, "the over-riding ambition is to design environments in which the client's commercial priorities can be met, while their customers relax in comfort, enjoy the hospitality and are impressed enough to want to come back and experience it all again." His views are borne out in JPA's work for carriers such as Singapore Airlines, Japan Airlines and US Airways and for hotels that include the Taj Mahal Palace and Tower, Mumbai; and The Pierre, New York.

stowage and puts a generous amount of space between adjoining seats. Unlike many seats, the reverse-herringbone suite provides plenty of upper body space, while its retractable arms can add an impressive 7.5in to seat width when lowered, or allow improved access for people with mobility difficulties. They also give passengers a choice between privacy and width when the seat is deployed in its 6ft 5in 180° lie-flat bed configuration.

"The reverse-herringbone suite is a hugely flexible product that neatly addresses the needs of both airlines and passengers," says Park. "From the airline's viewpoint, it takes into account the issues of passenger density, weight, differentiation and technological change, while the passenger is able to enjoy maximised living space, comfort, privacy and control of their own environment. It is both cost-effective and an important contribution to the passenger experience."

US Airways was the first carrier to adopt the reverse-herringbone suite, launching it as the Envoy Suite on its A330-200 fleet in December 2009. Each A330-200 will offer 20 suites, with fleet installation due to complete by the end of 2011.

02

made for Japan

One of JPA's hallmarks is its combination of traditional design motifs with the innovative use of materials and this is well-illustrated by its design for Japan Airlines' JAL Suite. Created for the airline's new Boeing 777-300ER aircraft, the first-class suite offers a seat that is reminiscent of a traditional armchair, while offering passengers a luxurious, spacious and private environment. The suite's success has resulted in it being deployed on an increasing number of JAL routes.

"US Airways was quick to spot the commercial benefits of the reverse-herringbone suite concept and have pioneered it very successfully," says Park. "Passenger feedback has been very positive and, in particular, the fully lie-flat bed, direct aisle access and improved living space have been very well received. A number of other airlines have expressed an interest in the concept and we look forward to unveiling some superb new products in the near future."

02. JAL Suite designed by JPA

WIDE APPEAL The business-class reverse-herringbone suite is not, however, the only JPA design that unites commercial imperatives with passenger comfort to great acclaim. JPA's business-class seat for Singapore Airlines was launched in 2006 on SIA's B777s and in 2007 on the first A380 to enter commercial service. Renowned as the widest business-class seat available, it might be assumed that issues of weight and passenger density were not an issue when it came to its design. However, the use of lightweight materials, an unpalletised design and a number of other design factors have led to a 15% weight reduction compared with other business-class seats. In addition, JPA's design employs a number of innovations, including a tessellated seat configuration that makes use of previously dead space within the cabin and allows the number of seats available to be maintained or increased. Although seat pitch is reduced, there is actually more space available to the passenger, each of whom has direct aisle access due to the forward-facing 1-2-1 layout.

To be configured as a bed, the back of the forward-facing seat quickly folds and connects to an ottoman to form a dedicated, cushioned and space-efficient diagonal platform that provides enough space for a 6ft 4in man to sleep and move comfortably between a variety of natural sleeping positions. In addition, the head of each passenger is hidden giving added, essential privacy.

Its innovative use of materials, commercial appeal and passenger comfort have resulted in the A380 seat winning a host of international awards, including 'Best Business Class' at this year's coveted SkyTrax Awards.

INTEGRATED APPROACH Both the reverse-herringbone seat and the SIA seat are examples of an integrated approach to design, engineering and manufacture that is typical of JPA's methodology. Launched nearly 30 years ago as a specialist transport and hospitality interior design practice, JPA has developed an end-to-end philosophy that combines architecture, design, engineering and commercial knowledge to produce interior environments that deliver on behalf of both the client and the user.

"On the ground and in the air," says Park, "hospitality interiors have to deliver a high-quality experience for the customer or guest, while offering cost-effectiveness at the design and build stage and acting as an ongoing revenue driver."

While JPA has built its reputation on creating premium interiors for aircraft and hotels, the same approach works well for economy interiors, believes Park: "One of the key elements to an enjoyable flight, whatever the class of travel, is to ensure that the passenger feels welcomed and valued," he says. "I am convinced that it is possible to achieve this without compromising on the need to drive down costs and make each seat pay its way. To this end, in addition to the stacked sleeper concepts that we have previously showcased, we have done a lot of work on high-density economy solutions that don't cut back on passenger comfort and do make the most of the available space and weight saving innovations. I am looking forward to getting these ideas into production."

Park knows from experience that working with committed manufacturers, making use of the latest materials and taking an imaginative approach to cabin space can make air travel work well for everyone, whether they are at the front of the aircraft or the back. "I am hoping that the days of passengers' boredom, frustration and restlessness are numbered, to be replaced by comfort, relaxation and engagement with their environment," he says. ☒

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madetomeasure

With a firm foundation in furniture design, PearsonLloyd offers airlines a bespoke design service that blends aesthetics with the commercial realities of the aviation market

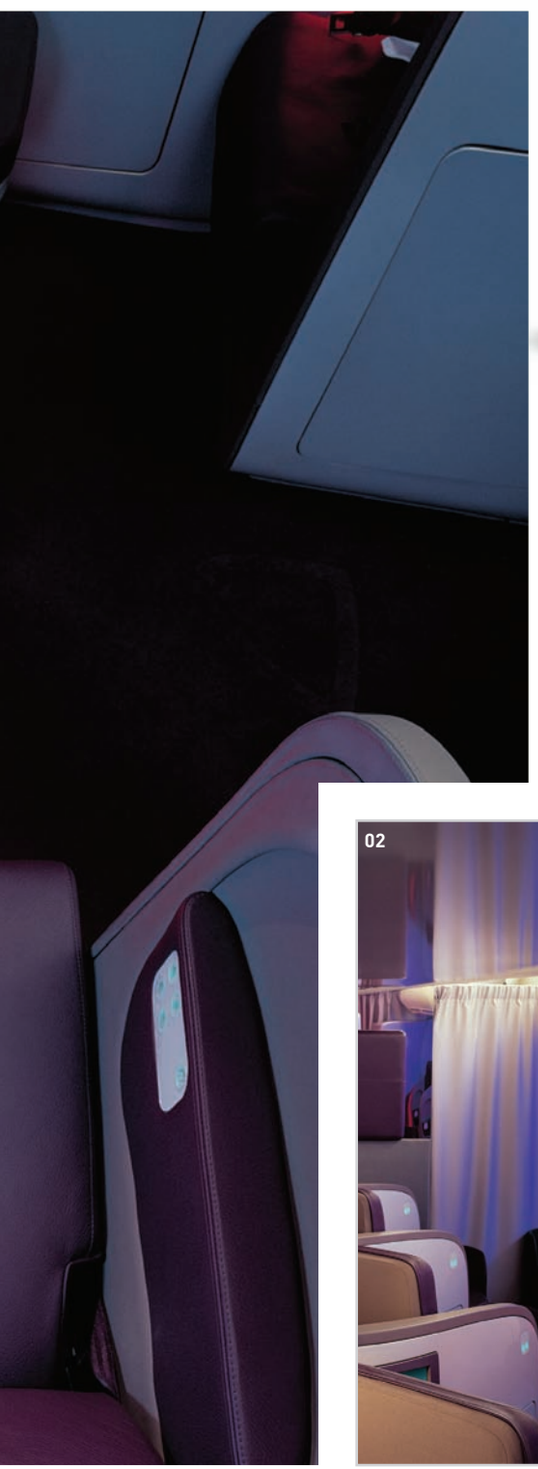
01. PearsonLloyd worked with Virgin Atlantic on its Upper Class Suite

Founded in 1997 by Tom Lloyd and Luke Pearson, PearsonLloyd is a London-based design studio that aims to bridge a series of fundamental cultural and technical gaps: between industrial design and the conception of furniture, between consultancy and the atelier, and between mass production and craft. Embracing everything from aircraft interiors and city spaces to hospital environments and the constantly evolving modern workplace, the studio's work reflects ongoing research into the relationship between people and the complex built environments they inhabit.

Perhaps the most difficult task addressed by PearsonLloyd is to devise solutions that accommodate personal and often very private experiences within communal, frequently very public environments. It is by welcoming this diversity and understanding similar problems from different perspectives, technologies, cultures and fields of design that PearsonLloyd has pursued its goal of delivering innovation to a broad client base. Accordingly, the studio's work is not only a visual response to the DNA of a client's brand, but a reflection of this process of understanding.

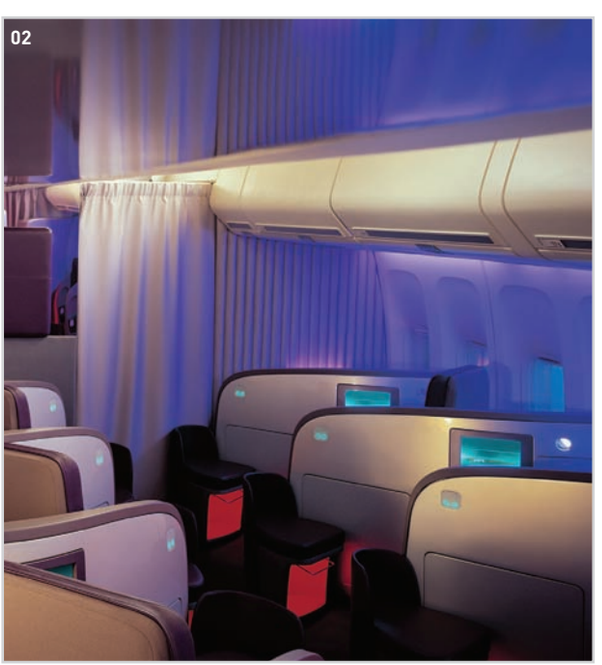
Lloyd and Pearson both trained in the craft of furniture-making as well as industrial design, but the studio is nonetheless firmly focused on the commercial realities of production and the market. The studio strongly believes that the harder and more layered the project brief, the more potential there is for innovation and beauty – hence collaboration is at the very heart of its practice. The company acknowledges that its role in developing new products, services and environments is part of a wide and extremely complex process, and that the seed of any break-through may come not only from within the team, but from the engineer, technician or client.

> THE TEAM BELIEVES STRONGLY THAT THE HARDER AND MORE LAYERED THE PROJECT BRIEF, THE MORE POTENTIAL THERE IS FOR INNOVATION AND BEAUTY



office overhaul

The office of today is no longer structured around the traditional tasks of data processing and management, but is a dynamic, collaborative environment in which people come together to share knowledge and information. PARCS (pictured above), a collection of furniture developed by PearsonLloyd for Austrian manufacturer Bene, embraces this vision, rejecting the basic structures of office landscape – desk, meeting space, boardroom – to produce a series of products that are virtually a hybrid of furniture and architecture. An instant critical and commercial success, PARCS has set a new standard for European office furniture and established Bene as a design leader in the market.



02. The Upper Class Suite – winner of the prestigious red dot - Best of the Best award

In every project the unique task, however, is to achieve a carefully balanced response to the different demands and interests at play – including the market, the factory, the budget and the brand – in order to deliver the right solution. In the event, that solution may not always turn out as initially expected, but it must feel at home within its context. There is a fundamental rationale to the studio's thinking and designing: things should feel appropriate and work well, while breaking new ground and expressing themselves as objects of beauty.

UPPER CLASS SUITE In 2001, PearsonLloyd was appointed to design Virgin Atlantic Airways' new Upper Class Suite. This project, the team's first commission in the aviation sector, was a perfect match for PearsonLloyd's hybrid

> A SIMPLE AND UNCOMPLICATED DESIGN BALANCES THE TECHNICAL SPECIFICATIONS OF AN AIRCRAFT SEAT WITH THE AESTHETICS OF FURNITURE DESIGN

03

03. The cobi chair designed by PearsonLloyd in conjunction with Steelcase Inc
04. The studio has also worked with Transport for London on station design
05. The PLC chair launched by Modus

flex and stretch

Workers in collaborative spaces do not adjust their chairs – they make do. It was this finding that prompted the development of the cobi chair, designed by PearsonLloyd for American office furniture manufacturer Steelcase Inc. A new type of chair that flexes and adapts to the form and movements of the user without the need for complex levers, cobi immediately allows its occupant to sit comfortably and requires no individual tuning. Its revolutionary rocking mechanism, in conjunction with a finely fluted, co-moulded back, supports users of any size or weight, uniquely adjusting to their back shape in a completely three-dimensional manner.

04

05

culture that unites furniture and product. A key challenge during the design phase was to soften the typically complex appearance of aircraft seating by employing a simple and uncomplicated design – to balance the technical specifications of an aircraft seat with the aesthetics of furniture design.

The result was a simple, elegant chair that articulates between dining and lounge positions through a seamless motorised action, as well as folding forward to create a flat bed. A 'shield' acts as both a cocoon for the passenger and a container of every functional element within the seat space, liberating the chair to express itself as purely as possible; it also responds to the contradictory dynamics of the cabin as both a public and private experience by enclosing passengers in their own individual seat space. The hard surface of the shield expresses this sense of cocooning and protection, while accentuating the softness and luxury of the chair within.

AND THE WINNER IS... The Upper Class Suite was launched in 2003, and has helped Virgin Atlantic build on its reputation for delivering some of the best products and services in the industry. It has also been the recipient of numerous design awards, including the coveted red dot – Best of the Best in 2004.

Seven years on from launch, the airline continues to feature the Upper Class Suite in its advertising, testifying to the product's successful expression of Virgin Atlantic's brand. Following the successful integration of the product into the fleet, the design was also licensed to Air New Zealand, which has enjoyed equal success in its own market.

Continuing its fruitful relationship with Virgin Atlantic, PearsonLloyd has worked with the carrier on a number of other new products, including the award-winning re-launched premium economy Super Seat, a brand new economy seat and a range of future projects.

IMPRESSIVE PORTFOLIO In 2008 the studio further strengthened its position within the aviation sector when it was appointed by Lufthansa to develop the business-class product for its 747-8I fleet. Since 2005 PearsonLloyd has also acted as consultant to Transport for London on everything from brand guidelines and new seating solutions to entire station design strategies. More recently, PearsonLloyd has entered the healthcare market, with a series of products designed to tackle problems as diverse as infection control and patient dignity.

PearsonLloyd has risen successfully to the rigorous technical challenges posed by the transport and healthcare sectors, but remains equally keen to preserve its core heritage in furniture design. To this end, the studio also takes on commissions for the contract and domestic furniture markets, which offer the opportunity for a purer expression of form, materials, colour and culture. Whether in Italy, Denmark or Japan, projects of this nature give the studio the opportunity to immerse itself more deeply in different cultures and markets around the world, each experience helping to build an understanding of and response to the next. A recent example of this is the PLC chair launched by the UK brand Modus in 2010, which has already been accepted into the permanent collection of the Design Museum in London.

PearsonLloyd thrives in this rich mix of territories and industries. Within the aviation design sector in particular, its truly unique position is its furniture heritage, which gives the studio an ability to deliver simple and elegant solutions to complex problems through a combination of intelligence and sensitivity. ☒

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Industrial Design Services

washandgo

müller/romca on the challenges of developing a first-class washroom for Lufthansa's A380 – complete with urinal

01. The washroom developed for Lufthansa's A380
02. Water temperature is displayed on the mirror surface

How would you use a precious 3.5m of space at the front of an A380 cabin if it cannot be used for seating? That was the question Lufthansa's product development team asked a number of international design teams in 2004.

Pitches were made for fitness rooms, sofa landscapes and bars. The designers from müller/romca quickly made up their minds – what was needed were two bathrooms – bathrooms worthy of their name. Lufthansa took a similar view, and müller/romca won the competition.

One day before the first article inspection – five years and 33 days later. The module, all connected up, is at the workshop of the supplier Dasell; the last components were installed just the day before. Jens Romca, co-founder of müller/romca, looks into the right-hand module, takes in the smell of protective foil and leather. To the right, a toilet is located behind a small divider; everything is white and very bright in here, pure freshness. Behind a small, shiny door on the right, the first urinal in aviation history has become a reality.

02


01

Two steps on is the make-up zone, dominated by a gigantic mirror installed on the in-board side, against the staircase. Sticking to müller/romca's vision and placing the washbasin in-board has meant there is room to stand up, and the positioning of the mirror doubles the perception of space.

In front of the mirror, there is a snow-white washbasin, while inside a large cabinet are all the dispensers. The view takes in mixers and fittings, all designed for a clean, functional and easy-to-understand environment.

WASH LIGHTING Water temperature is controlled via a single, separate regulator and displayed in a backlit field on the mirror surface, with LEDs hidden behind. This lighting concept was designed by müller/romca in 1998 and first used in the lavatories of the

> ELECTRICAL POWER IS AT A PREMIUM, EVEN ON BOARD AN A380 – AND YET, TO CREATE A SENSE OF FRESHNESS AND HYGIENE REQUIRES ADEQUATE LIGHTING

03. The make-up zone boasts enough space for a passenger to get changed

04. Everything is designed to be bright, fresh and easy to understand

A340 500/600. Today it has become the standard. The diode module is behind the mirror, and the glowing LEDs are visible through frosted zones in the mirror. It is designed to produce a pleasant illumination, with an easy-to-clean, unbroken mirror surface.

The lighting of the space as a whole played a major role in the development of the bathroom. On the one hand, the bathroom was to appear discreet and simply be bright enough. "This sounds easy enough, but it was not quite so straightforward as that," says Romca. "Electrical power is at a premium, even on board an A380. And yet, to create a sense of freshness and hygiene requires adequate lighting."

To achieve this effect, ballast units were used in addition to the diodes. "Combining these two light sources also means that a greater frequency range is covered," says Romca. "The result is improved facial complexion, and better colour rendition of the different materials."

GLAM ROCK The floor was another challenge. The material is based on inkjet printing, producing extreme responses to different light sources. Simply using a different type of diode completely changed the visual impact

> THE RESULT HAD OBSERVERS SHAKING THEIR HEADS IN DISBELIEF, SAYING 'REAL STONE IN AN AIRCRAFT? THESE PEOPLE MUST BE CRAZY!'

05. The make-up zone
06. The washbasin table is finished with a grey plastic made to look like stone

toilet trained

Jens Romca and Jochen Müller always see it as an exciting challenge to fit an entire bathroom with all its fixtures into a minimal floor space – no more than 1m² for standard toilets – and to do it in such a way that it can easily be understood and operated by anyone, anywhere in the world.

"There probably is no other design office worldwide that has designed as many aircraft toilets," says Jens Romca, co-founder of müller/romca. "It started in 1999 with the toilet that is now used in the entire Airbus long-haul fleet – with the exception of the A380. But even there, the toilet was fashioned by müller/romca."

In addition, müller/romca has frequently been commissioned to carry out studies, for example for a lavatory that would allow additional seats to be accommodated, for which the designers received a Crystal Cabin Award in 2008.

Since then, two more bathrooms have been developed for Lufthansa and are scheduled for installation on Airbus and Boeing aircraft in 2011. Right now müller/romca and its team of seven are developing a complete first-class cabin for Lufthansa, to be introduced in 2011.

from the warm grey stone of the Lindlaer Grauwacke to a magenta or a green. An endless succession of sample prints were needed at the manufacturer, and müller/romca built its own lighting mock-up to allow everything to be tested under realistic conditions.

The Grauwacke stone also presented a challenge in another sense. The underlying idea was to match the design of the floor with that used in Lufthansa's first-class lounge in Frankfurt. "Trials with thinly cut real stone on an aluminium honeycomb, and visits with geologists and quarries showed that sandstone is generally not suitable for use in bathrooms, since it lacks wear resistance against acidic cleansers," says Romca.

Since then, following a number of presentations and decisions, stone was the chosen material for the floor covering and the wash table, a suitable alternative was needed. A grey plastic was selected for the washbasin table, and a process was developed to give it a dark grey grainy texture. The effect was perfected by adding a pinch of mica, as contained in the real stone. "The result had observers shaking their heads in disbelief, saying 'Real stone in an aircraft? These people must be crazy!'," says Romca.

THE WATER TEST

Another time-consuming aspect of the project was the development of the urinal.

"The reasoning behind including the urinal in the bathroom is that 70% of first-class passengers are male, and for them, there would be a clear, immediate improvement in terms of convenience," explains Romca. "The indirect benefit for female airline passengers is cleaner toilets."

The urinal is designed to be compact, with relatively high positioning to make aiming easy, and a shape optimised for greater hygiene. Of course, a product like this cannot simply be developed on paper. The designers from müller/romca therefore selected various products that appeared suitable to serve as bowls, mounted them over a real toilet and tested them in the real-life setting of the office. The incidental outcome was a product fit for use in practice.

While the vacuum unit is based on a conventional aircraft toilet, the engineers still had to invent a number of innovations, including an odour seal and a sensor to detect overflowing water. Wherever direct testing was not possible, the designers drew on their extensive experience in the design of lavatories. ☒

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publicprivatepartnership

Seymourpowell presents a radical new seating system, featuring a flexible layout that offers either privacy or conviviality as required

01. Facing or opposing seats provide flexiblity for various uses
02. In this example, one seat has been rotated away from a 'bay' of three

Imagine a seat layout system capable of offering more flexibility over interior layouts by effortlessly switching between either seating or sleeping arrangements. Seymourpowell has developed just such a system, allowing a given cabin layout to be reconfigured rapidly and easily – either within the VIP segment or scheduled airline operations.

A number of factors drove the exploration and development of this interior seating layout concept. Firstly, there is the ever increasing demand from travellers to have more choice over not only the amount of space they will pay for, but also the specific configuration of that space within the cabin. Whether these are leisure or business travellers, offering the choice of sitting with others in a spirit of conviviality, being able to work together as a group or, alternatively, in the privacy of a separate zone as a pair or solo traveller does not exist in a single layout solution currently.

Secondly, aircraft interior layouts remain relatively inflexible, based on load factor, price per cabin zone or 'product' and the individual aircraft routing plans. There is little or no ability to change seat densities or product 'offer' easily and quickly according to demand, scheduling, sector length and day/night operations.

In these highly volatile times, a solution that could offer more flexibility to both the traveller and to the operator in terms of aircraft utilisation and price flexibility seemed worth exploring.

CLUB SEATING The core of the idea allows two (or more) sets of seats to face another two sets of seats creating a so called 'bay' or 'club' seating system where people can share the space in a convivial manner. From this arrangement of shared space, by rotating two (or more) of the seats (one of the facing pairs for example) by an angle sufficient to turn the occupant away from the seat in front of them, the layout changes to two sets of

> THERE IS A WHOLE RANGE OF METHODS OF PROVIDING PRIVACY BETWEEN THE ADJACENT SEAT PAIRS

facing seats with an immediate level of privacy between the two facing pairs of seats, or 'cocoons'. There is a whole range of methods of providing privacy between the adjacent seat pairs. In the case illustrated, a rigid style back shell on the seat is proposed. Each seat will recline within the shell and include a legrest to provide 'lounger' levels of comfort. The pitch provided in both the facing or bay arrangement and in the conventional layout allows for seat recline. Tables can be rigidly floor mounted and drop down, or be provided with more conventional in-arm solutions.

From the original bay arrangement of two sets of facing seats, a single seat can be rotated to face away from the seat in front, providing privacy for a single occupant, whilst allowing a degree of privacy and conviviality for the remaining set of three occupants.

Sequences of the core layout arranged together create a system where an extended combination of facing pairs, facing quads, and single seats in a traditional airline layout can be provided for, allowing great flexibility of the


03

game, set and match

The layout could allow operators to match load factor and aircraft routing to customer choice and ability or willingness to pay. Layout studies on both single- and twin-aisle aircraft show the possibility to vary passenger numbers significantly between seating-only and a sleeper configuration. It may even be possible to configure the interior according to the 'access price' – those wishing to sleep in a lie-flat bed will pay for the space accordingly, whilst those wishing to travel together in recliner seat comfort can do so and pay less within the same cabin, whilst sharing the same service offer.

The system would allow a single aircraft type to offer higher density bay seating for shorter sectors or sleeper services for longer sectors increasing flexibility of aircraft utilisation as demand for different services varies throughout the year and the economic cycle.

The seat itself is conceptually relatively simple from a mechanical viewpoint, promising relatively low weight and cost. The recliner mechanism will be simpler than current lie flat systems, with the legrest from facing seats forming the sleeper unit with minimal cantilevering. A simple stowed mattress will add to comfort. The layout does not require all the seats to rotate to allow the flexibility described, meaning that a significant number of seats can be as simple and low weight as possible.

orientation of seating within the environment and of the overall layout of an interior space. The conversion can be undertaken very quickly by the operator of the interior environment, based on the requirements of the combination of travellers for that specific journey. With the addition of utility storage units between the bays, and appropriate lighting, both the physical space and the relevant ambience can be changed very easily to suit customer preference and mood. The storage units can be tasked for differing levels of privacy and luxury in terms of the amenities provided.

Passengers can thus pre-book a layout to suit their needs – either in groups, pairs or the privacy of travelling solo.

03. Floor-mounted tables can be dropped down to make room when the seats are configured for sleeping

SLEEPING SPACES The concept also allows for the conversion of a meeting or dining space into a set of private sleeping spaces. The rotated facing seat sets are designed to convert to loungers or true lie-flat beds – it is therefore possible for an operator to offer a convivial space that can be converted to a private resting or sleeping space. This can be offered to individuals as a personal sleeping bay or to couples as a private dining and relaxing space that can then convert into side-by-side singles or a true double bed. The layout staggers the sleeping 'cocoons' providing a real sense of privacy, whilst also allowing access to all sleeper sets by the crew directly from the aisle. In the case of single occupancy, a personal stowage and utility centre adds to the sense of privacy, providing convenient personal stowage, an upper level wardrobe and could include a personal mini bar or other modular utilities.

For those looking for even more privacy and personal space, it is possible to book a block of three seats – providing a seat for work, eating and relaxing on the aisle side, and a bed on the outboard side that is still readily accessible by the crew.

FLEXIBLE APPROACH It may be that the same aircraft could offer a different service with higher density bays in the daytime and a lower density super premium sleeper service according to demand and routing requirements – providing flexibility for both operators and passengers.

For business- and premium-segment operators, this new approach offers their customers increased convenience and/or privacy according to personal choice. The system could also be applied to the corporate and VIP market, where the need for easy transformation from working group to sleeping facilities, individual private spaces to group dining is central to many missions. ☒

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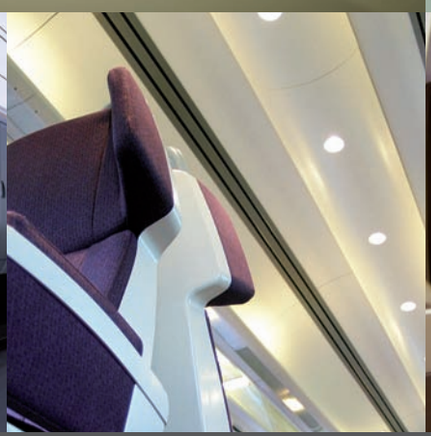

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flyingstart

A relatively new name in BBJ completions, Altitude has built a mock-up to demonstrate its skills, and secured its first green completion

01. A BBJ concept

Altitude Aerospace Interiors has had another year of development and growth in 2010, in both the airline and private jet markets. The company says it is experiencing resurgence in these sectors as airline carriers seek to stay ahead of the competition with innovative new premium-cabin designs, and private jet owners look for new refurbishment and maintenance options.

In last year's *Aircraft Interiors International Showcase*, Altitude identified 2009 as a year of firsts. From achieving EASA Part 21J status and Design Organisation Approval (DOA), to being recognised as a Boeing Business Jet (BBJ) completion centre, Altitude has established itself quickly in the industry. 2010 was no different – and saw the company contract its first BBJ green completion, complete a fleetwide interior rollout for a major airline, and grow its pool of engineers, programme managers and designers.

VIP AIRCRAFT

Having established itself as a Boeing-recognised BBJ completion facility in 2009, Altitude is rapidly developing a positive reputation as a new player offering BBJ operators an alternative facility for maintenance and interior refurbishments. The company plans to extend this reputation soon to green BBJ completions.

In early 2010, Altitude announced its first green completion contract, for an Asian customer, scheduled to be on dock in 2012. Michael Pervan, general manager of Altitude, says winning this was a major turning point. "We had completed many maintenance and interior modification programmes on BBJs, but the elusive first green completion was one that we had to wait for – and we're pleased we did," says Pervan. "I really feel that the lessons we made along the way have positioned Altitude well. We were able to demonstrate to our customer that we had the capability, knowledge and drive to undertake such a major project." The BBJ will arrive at Altitude's completion facility in Christchurch, New Zealand, where, in conjunction with support from Air New Zealand Technical Operations, it will be installed with a customised interior including electrical, IFE and mechanical systems.

A SHOWCASE

Altitude has also spent 2010 undertaking another green completion of sorts, project named Pounamu. The organisation has installed an impressive VVIP cabin on a retired B737 aircraft at its facilities. Pascal Jallier, head of programmes and procurement at the company, says the project came about from a need to reassure potential customers that it knew how to undertake complex programmes – even though it is a new name to the industry.

> IT CERTAINLY HELPS OUR DESIGNERS AND CUSTOMERS TO BE ABLE TO UTILISE AN ACTUAL AIRCRAFT INTERIOR TO VISUALISE VARIOUS CABIN CONFIGURATIONS

02. The Pounamu mock-up

"Although our design, technical and installation experience on B737 aircraft stems back decades, the Altitude name was new to the BBJ market," says Jallier. "We sensed that potential customers, although impressed with our facilities, knowledge and experience, really wanted to see a tangible example of what we could produce. So, through Pounamu we sought to partially refurbish a retired B737 fuselage to look exactly like what you'd experience on board a BBJ."

The mock-up includes an impressive entranceway flowing through to a relaxing saloon with bar area and seating for six people. A fully functional conference room for six people follows on from the bar area, complete with a 50in monitor, swivel chairs and credenzas.

The remainder of the fuselage is left for fit check testing and further mock-up area for customer designs. "It certainly helps our designers and customers to be able to utilise an actual aircraft interior to visualise various cabin configurations and components, and from there look at actual layouts that will work best for individual customer needs," says Jallier.

OPTIMISM Altitude remains optimistic about the coming year for the BBJ market. With BBJs starting to come in for 144-month heavy maintenance checks; refurbishment and modification of existing aircraft; as well as new BBJs and the launch of larger Boeing VVIP jets in the market; completion centres are preparing for some busy years ahead, and Altitude is well positioned to take a piece of this market.

"We've definitely noticed a rise in bid activity in the market – on all fronts," says Matthew Woollaston, head of commercial for VIP aircraft at Altitude. "Being located in the southern hemisphere has meant most of our interest is coming from owners and operators based in Asia and the USA's west coast. As our focus is on establishing ourselves as specialists in BBJs only, rather than spreading skills and resources across smaller jets and wide-body aircraft, Altitude is definitely in the mix of completion centres for discerning BBJ owners and operators to consider."

> ALTITUDE WAS ENGAGED TO PROVIDE SOLUTIONS FOR SOME OF THE MORE UNUSUAL AND CUSTOMISED ELEMENTS FOR THE AIRCRAFT CABIN

through the roof

In the search for new designs and innovative solutions for VIP interiors, Altitude has developed a new-generation ceiling for its full VIP B737 mock-up. Altitude has engineered a new ducting system design, which pushes the boundaries in terms of shape and function. The company says the result is a more spacious cabin that provides an additional 4in of height compared with the standard recess ceilings in most VIP jets today.

This ceiling mock-up, built with aerospace-certified material, is already available for installation on any BBJ – whether a green project or refurbishment. This new development offers the VIP jet market a unique and innovative design to refresh the overall look and feel of the cabin.

03. A 'transition zone' monument for Air New Zealand's B777-300ER
04. Altitude also designed a fully chilled galley/ bar unit for the aircraft

COMMERCIAL AIRCRAFT Meanwhile, on the commercial airline side of Altitude's business, the design and engineering team have been hard at work on Air New Zealand's new fleet of B777-300ER aircraft. Altitude was engaged at multiple levels of the project. In the initial phases Altitude was part of the multidiscipline, multi-company team that helped define possible solutions for seating, layout and service throughout the cabin. This initial phase of the project resulted in the concepts for Air New Zealand's new seating solutions.

Once Air New Zealand had selected vendors for these seats, Altitude was engaged to provide solutions for some of the more unusual and customised elements for the aircraft cabin. Altitude's experience at providing customers with unique solutions for the Door Two zone on B777 aircraft meant that it was perfectly placed to develop a solution designed to provide all of the functionality of a fully chilled galley, with the style and sophistication of a trendy city bar.

The need for customised equipment didn't stop there. Because of the unique shape of the business-class seats, and equally the unique shape of the new premium-economy seat, there was a requirement to create a solution that provided an elegant and practical transition between the two zones. Altitude was tasked with creating these 'transition zone' monuments, which include IFE, tray tables, and basinet fittings, all within an unusual and small envelope. Also part of Altitude's brief were business- and economy-class closets, partitions, and ceilings for the Door Two and Door Three areas.

At the same time, Altitude has been quietly working away on products for Boeing's new B747-8i aircraft. While it is too early to show any detail on this project at this stage, Altitude is confident that the products that are due for the first-class zone on this new aircraft will be a spectacular addition to the cabin.

Not all of Altitude's airline projects have involved developing new products for new aircraft. In fact 2010 was a year of firsts for Altitude on the integration engineering front. The company received its first EASA STC for a B747-400 reconfiguration in October 2010, and delivered reconfigurations for a B767 fleet, and an A320 fleet.

KIWI STYLE In true Kiwi style, Altitude is fast developing as an organisation with a can-do attitude and determination to take on even the most established completion centres servicing the private jet market – as well as design and integration specialists servicing the commercial aircraft market. The future looks promising for the organisation as it sets out to secure more BBJ green completions, modifications and refurbishments. Equally promising is the future for the commercial airline side of the company, which is in discussions with several premium international carriers looking at upgrading their first- and business-class cabins. ☒

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Patrick Lindon Industrial Design's aircraft interiors are based on three decades of experience and a solid understanding of what airlines want

01. A new cabin concept with staggered seats for a Japanese airline

Successful designs live up to a vast spectrum of demands – from brand strategy, research and development, to technical and maintenance issues, not to mention the commitment to passengers' needs. "When starting a new project, the essence of our initial strategy is, when possible, to talk with each of these departments," says Patrick Lindon, whose most successful interior concept to date is the business-class seating and cabin interior he designed for Swiss International Air Lines.

"Brand recognition is the main topic of the marketing division," he explains. "Product development is responsible for translating dreams within the borders of an airline's corporate identity (CI), striding forward with long-term plans for success, while attempting not to lose too much of the dream aspect. Routine maintenance must be taken into careful consideration, which can be greatly simplified through logical design and thought-through production development."

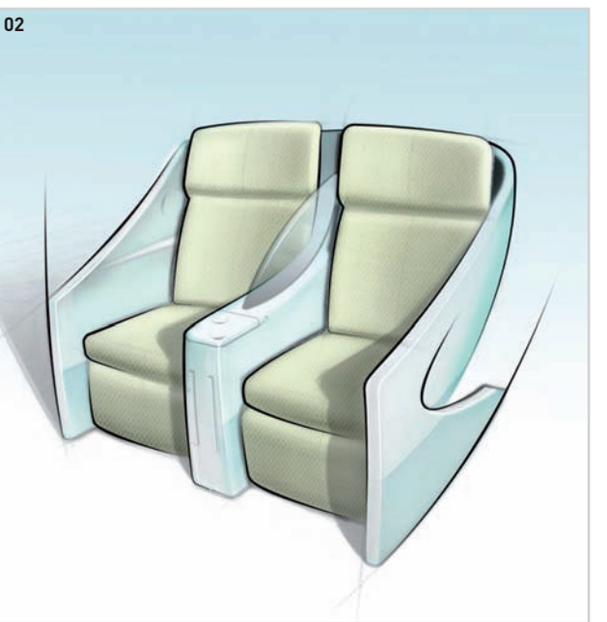
IDENTITY Corporate identities are a vital part of the equation. "They must be flexible to change with the times and are constantly adapted and fine-tuned to modern tastes," says Lindon. "Designers are the trendsetters of the future. We analyse current trends, forecast and develop what will fit into the marketplace five years from now."

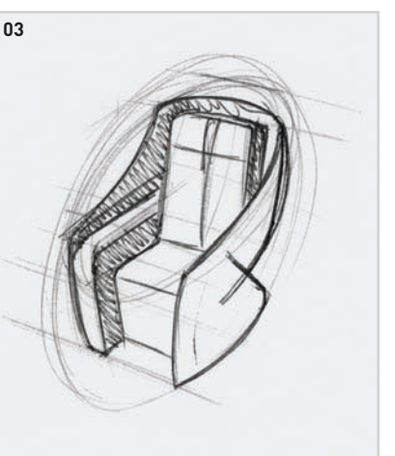
CI manuals define colours and shapes, but Lindon says that often they are missing components for the 3D domain. "In the case of retrofitting or second-hand aircraft, if a seat fairing or interior colour are not able to be replaced, we develop innovative concepts to make the old compatible with the new," he says.

There are basic concepts to help make spaces look bigger. Lindon says these concepts have little to do with fashion or zeitgeist, but instead with the psychology of how space and lighting function. "Passengers subconsciously take in the feeling of a cabin within seconds upon entering an aircraft," says Lindon. "Luggage is then stowed and preparations for flight are made, placing personal items within reach and creating your own personal space. Finally upon settling down into the seat, you can sit back and perceive your surroundings. This is the first physical contact with the materials and with the seat. Other senses come into play – the look, the smell and tactile elements. We believe in using genuine materials, such as leather and metal. And these must be clean – it is absolutely taboo for surfaces to feel sticky or greasy or appear to be worn out."

In a global world, ergonomics can also be a relatively difficult topic to

> WE ANALYSE CURRENT TRENDS, FORECAST AND DEVELOP WHAT WILL FIT INTO THE MARKETPLACE FIVE YEARS FROM NOW



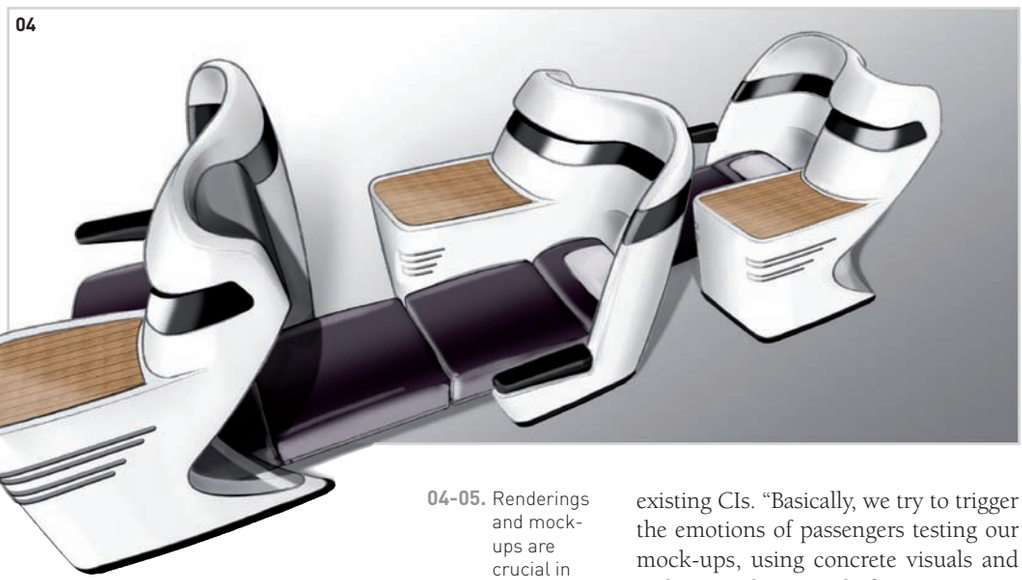


02-03. Some aircraft seat sketches

tackle. "Generally speaking, Asians are smaller and finer than, for example, North Americans, who are considerably taller and wider. Either we design aircraft interiors according to specific flight routes, or we make them adjustable by implementing movable seats and cushions," says Lindon.

Passenger loyalty among frequent flyers, he argues, does not only emphasise ticket pricing, destination selection and scheduling, because ultimately these passengers spend so much time on aircraft. The service, quality of meals, flight connections, and frequent flyer perks can all be important deciding factors as to which airline they choose. "But in our opinion, the most important factor is the comfort of the seat, and in the case of long-haul flights, the quality of the bed," adds Lindon. "Can you sleep? And how well can you sleep? Comfort on an aircraft means it feels like you're at home. You can choose what you want at home, but when it comes to flying, you can only choose the airline."

VISUALISATION Renderings are used mainly to explore colour schemes and to support decisions made by airline management. They can help in testing out seat arrangements or visualising



04-05. Renderings and mock-ups are crucial in evaluating new seats

> WE INSIST ON TESTING OUR OWN SEATS AT LEAST ONCE BEFORE THEY ARE MANUFACTURED, MEANING WE SLEEP IN THEM

existing CIs. "Basically, we try to trigger the emotions of passengers testing our mock-ups, using concrete visuals and real materials, instead of just expecting them to use their imagination," says Lindon. "Passenger trials should be conducted in real cabins, with real lighting conditions. Frequent flyers are definitely the best candidates for this. We insist on testing our own seats at least once before they are manufactured, meaning we sleep in them. This is the easiest way to determine how our products are functioning and whether or not we've forgotten something."

DREAM BECOMES REALITY "If we want to bring new products on board, we must ensure that they are either already certified, capable of being certified, or certify them for our clients," says Lindon. He explains that certification of newly designed components must be done about half a year before construction begins. "Often design offices have terrific ideas but these cannot be manufactured because the materials are not certified for flight," he says. "Between the initial technical coordination meeting and the critical design review, the designer can become more of a nuisance than an asset, especially when there is a lack of understanding about production workflow. Instead of being an obstacle, we support acceleration and simplification of technical solutions and design implementation." This involves teamwork, which to Lindon means letting go of "designer ego-tripping", being open to new ideas, analysing situations and working towards a common goal.

MAINTENANCE "The cost of designing an interior is relatively small compared with the cost of flying an aircraft that is not carefully planned and implemented. It is better to correct mistakes during the design process, than to do this when the product is being manufactured – or even worse, when an aircraft is already in service. That is why most designers are not allowed to make changes after the design freeze," says Lindon. "But we are fortunate to be allowed to continue working beyond this period, because we have an extraordinary understanding of how aircraft seating and interiors are built." Intelligent solutions can speed up production time, and once the new cabin interiors are installed, downtime can be minimised.

"We know which parts must be robust, and for these, we choose hard surfaces. We design surfaces that are easily removed for refurbishing. Also, we avoid edges and corners which collect dirt and move seams to places that are not only aesthetically, but technically smart," says Lindon. "Every time I fly, I check out wear and tear on my own cabin interiors, as well as that of the competition."

LOOKING AHEAD "My dream for future aircraft interiors is to use high pressure laminates (HPL)," says Lindon. HPL is commonly used for countertops, tables and work surfaces. It is very hard and can be produced in all possible colours, surfaces and textures. "These days, HPL exists only in cylindrical or flat form. It would be incredible to design a seat shell using this material. It could be machined and finished in a way that would look quite impressive. And since the material is solid in colour, you wouldn't see scratches or other damage," says Lindon. However, he believes the production costs are presently too high, because the milling tools are expensive, since the panels are produced under extreme pressure. "But that is definitely something to look forward to," he says. ☒

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Aircraft Interiors *Designing the future.*

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thefinalfrontier

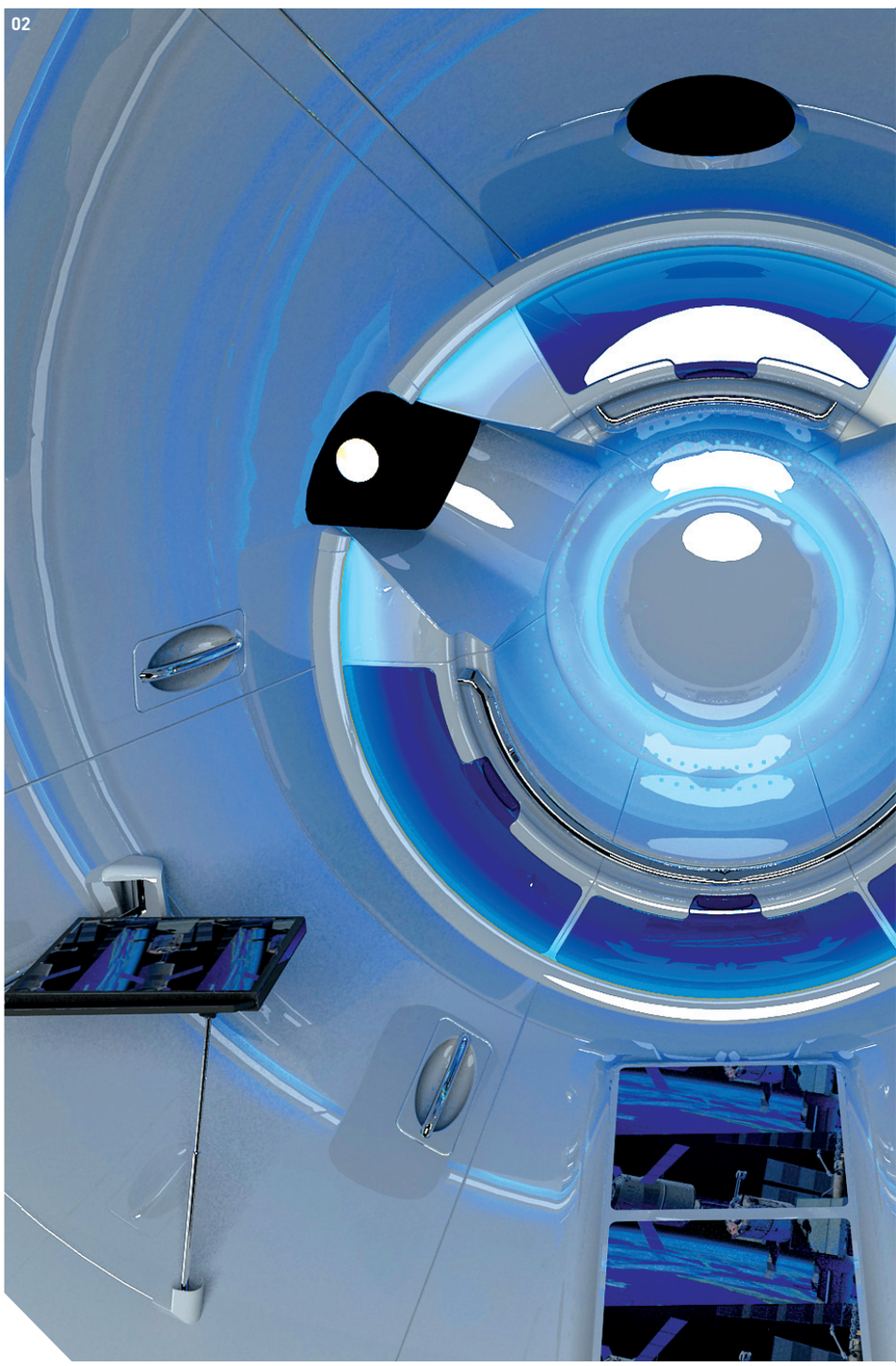
Recent assignments have challenged iDS Hamburg to conceive, design and implement innovative space concepts.

01. A mock-up of the ARV space flight capsule
02. The ARV space capsule is designed with zero gravity in mind, with plenty of handholds!

With three decades' experience in transport and product design, iDS Hamburg can look back on a portfolio of successful designs, ranging from aircraft cabins to cockpits, pilot seats, sport cars, high-speed trains and more. Over the years iDS has gained a deep understanding of the requirements of the aviation industry. In its responsibility to develop holistic design solutions, iDS Hamburg has always set great value on understanding the needs and wants of the consumer, and therefore constantly keeps in touch with the market.

HILA "These requirements are constantly changing. We are challenged again and again to re-evaluate our own viewing angle," says professor Werner Granzeier of the Hamburg University of Applied Sciences (HAW Hamburg), and head of iDS Hamburg. "Society creates ever new requirements. For example, as society ages the need to provide more space for utilities on aircraft will rise, as they will need to be accessible for a rising number of people with restricted mobility. How can the airlines


01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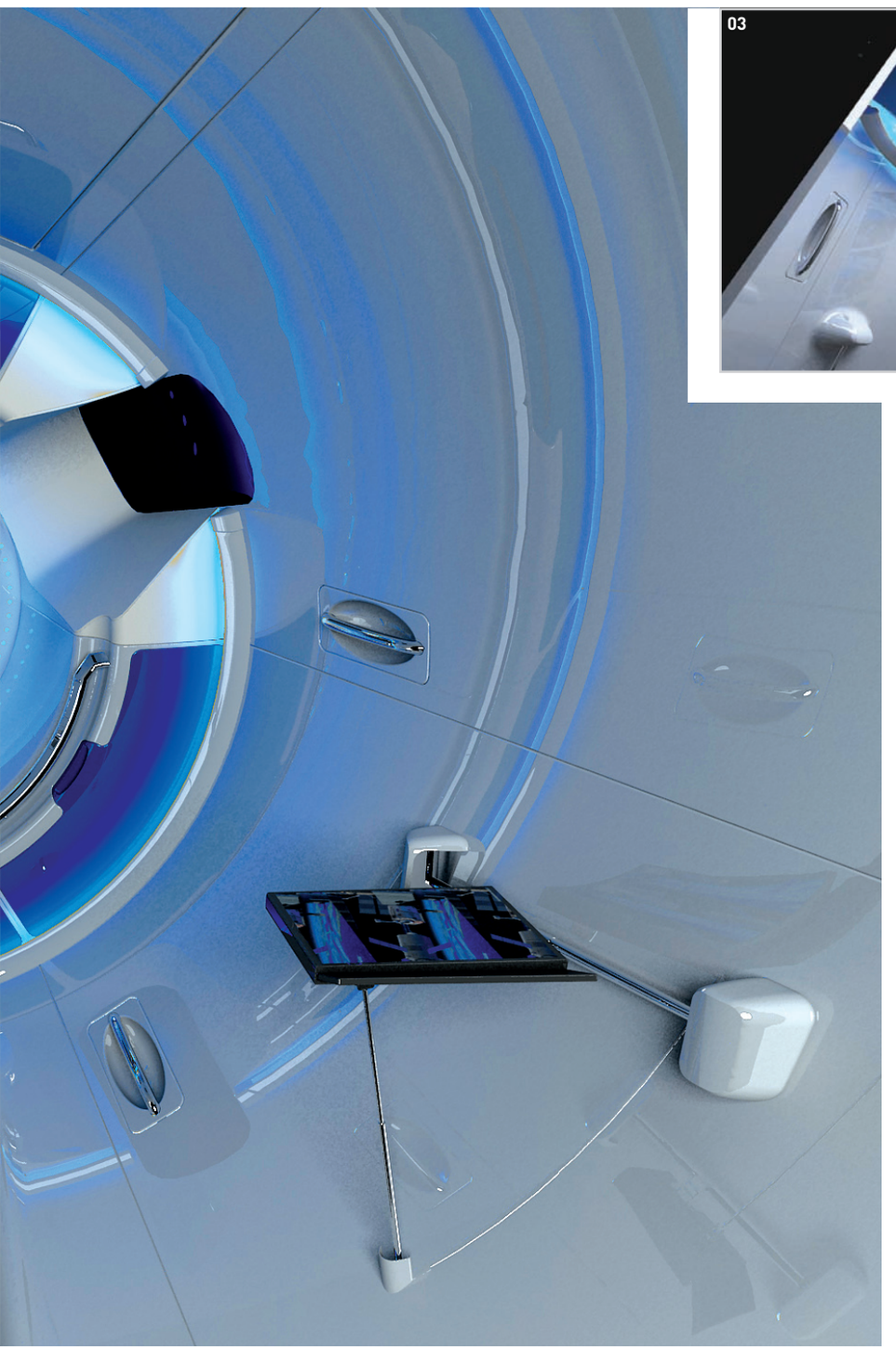
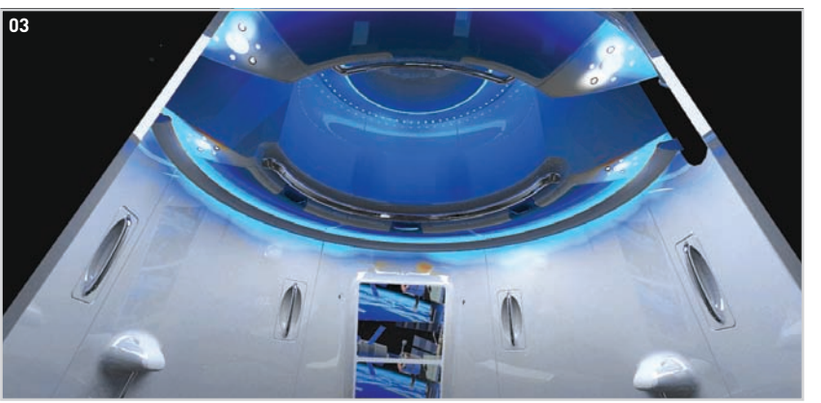
> AS AIRLINES AND DESIGNERS CANNOT EXTEND SPACE, THEY MUST EXTEND THE PERCEPTION OF SPACE





make this space affordable, when they are straining to provide for the extra row of seats even now?"

Consequently, Granzeier reasons, as airlines and designers cannot extend space, they must extend the perception of space. "Targeted consumer research of future lavatory requirements has shown that more space is not only a pressing requirement, but is at the very top of the wish list, more space being often equalled to more comfort," says Granzeier. "Last but not least is the question of hygiene and how to provide for it in a restricted environment."

The High Integrated Flexible Lavatory (HILA) concept was created to address these needs, designed to offer more space, convenience, comfort and hygiene through its flexible, expandable concept. The concept, which won a 2010 Crystal Cabin Award in the passenger comfort category, was developed by Dasell together with Airbus Operations and in cooperation with iDS Hamburg.

On the ground the lavatory space is narrowed to a minimum to allow comfortable boarding. In flight the lavatory is extended to full size by the crew, via a patented mechanism, into space that is unused during flights, such as entrance areas. Space is assigned to where it is most needed.

03. The ARV capsule is designed to accommodate two pilots and a tourist, in a very limited space

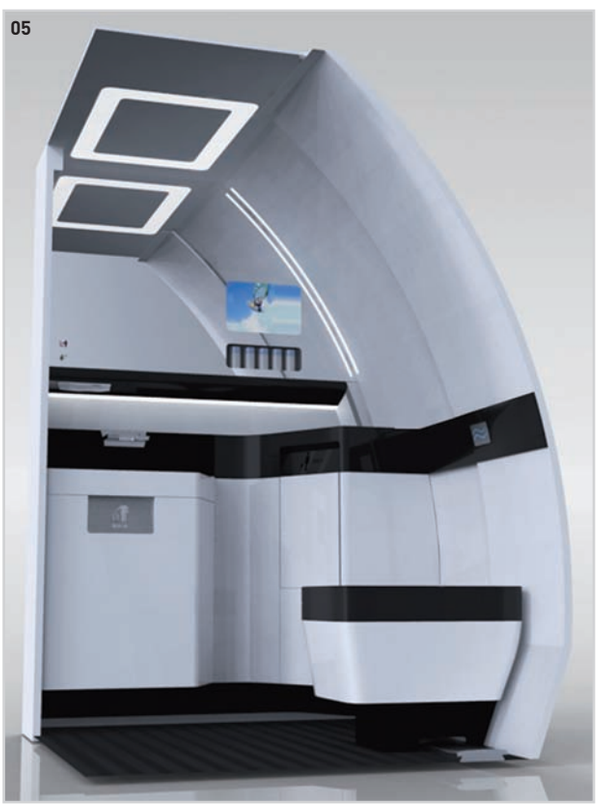
> THE SPACE WE UTILISE IS ALSO A SPACE IN OUR MIND THAT MUST NOT BE INFRINGED

04. HILA features a separate urinal and toilet bowl
05. HILA can be expanded into the boarding area when in flight

The concept enables airlines to keep the same number of seats, but is designed to deliver a better experience.

PERCEPTIONS iDS Hamburg also concentrated on the perception of space during the development of this product. "The space we utilise is also a space in our mind that must not be infringed," says Granzeier. "The lavatory must provide a space that is – for the duration of its use by the individual – a personal space. That clearly means going beyond merely providing room."

The company says the HILA design tackles the perception that usage by both male and female passengers means passengers' personal space is infringed. Therefore, HILA has both a toilet bowl and separate urinal, combined in one housing, with touchless functions. "This results in a division of male and female space in one common space," says Granzeier. "The design is thoughtful and in step with the latest interior design fashions, but still aims for a long life, making this investment in the future viable."



OUTER SPACE Another recent project challenged iDS Hamburg, in cooperation with HAW Hamburg, to tackle still greater space constraints. The aim of the European Space Agency's Advanced Re-entry Vehicle (ARV) project is to develop a spacecraft to deliver cargo, astronauts and a tourist to the International Space Station (ISS) and back. iDS Hamburg was asked to provide a detailed study for the cockpit arrangement and flight operations.

"If humanity visits heaven, it should be as comfortable as possible," says Granzeier. "Paradoxically, as we reach further into outer space, the space available to individuals becomes more restricted, and our dependency on this little space becomes absolute."

The company had to explore how to exploit this restricted space to the optimum, how to ensure optimal interaction from this contained space to the vast space outside, and how to bend this space for the passengers' experience of zero gravity. "Commonly we move on a two-dimensional space with our feet while our world only becomes three-dimensional via our eyesight, our hearing and the limited area of our sense of touch," says Granzeier. "In zero gravity our moving space truly becomes three-dimensional. And have you ever pushed something without the resistance of the floor under your feet? Even the slight force we need to push a button must be countered somewhere."

A 1:1 scale mock-up of the capsule has now been displayed at several industry fairs to give visitors a glimpse into the space flight experience. The visitor can slip into one of the three ergonomically designed seats, two for astronauts and one for the tourist. Via a console panel aligned to the seat, a visitor can even conduct a simulated docking to the ISS, following the process on four monitors. In a real space flight the passenger would also benefit from a window into space, and strategically positioned handholds on the seats and in the upper section of the capsule designed to ensure directed movement in zero gravity. All this is finished in carefully chosen colours, surfaces and lighting, to prevent a feeling of claustrophobia.

The design is to be developed further in the future, adding a second tourist. iDS Hamburg and HAW Hamburg anticipate that the capsule could be ready for deployment in 2014. Would Granzeier, if it was affordable, book a flight to the ISS? "Immediately," he says. After all, he himself has provided for the passengers' comfort. ☒

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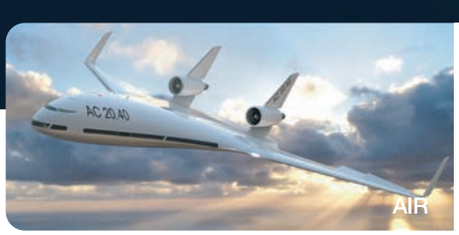
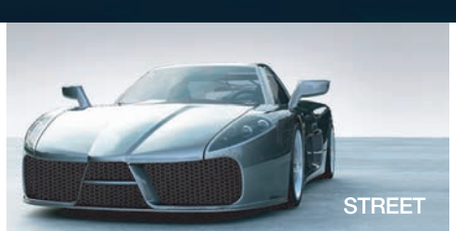
For decades companies have globally used industrial design as one of the most important instruments of their success.
Especially in long-term lifecycles design is a strategical element as well as a proximate factor of the profitability within the development and production of high grade assets.

Not only mere formality: Successful Product Design
Competitive and enduring operating products require a specific design profile and an individual statement of the company`s corporate identity.

If self-contained esthetics and emotional factors are combined with logical functionality and qualified ergonomics, a long-lasting success and an ultimate acceptance within the market can be guaranteed for a product.





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sittingcomfortably

In designing seats for the airline market, Ludekedesign has delved deep into both the physiological and psychological factors that determine comfort

It's quite an endeavour designing seats for air travel, as those who are involved in any of the myriad steps involved can testify. "Just designing a seat for the human body encompasses many different points of view and approaches, as evidenced by the wide and continually growing palette of residential and contract furniture. There is no single answer, just as there is no one definition of what sitting and a good seat is," says Christine Ludeke, principal designer at ludekedesign. "Take that into the aircraft cabin, and this complexity is multiplied by the addition of aircraft-specific certification requirements, the public aspect of commercial aviation, an airline's revenue politics and the increasing emphasis on environmentally sound solutions and weight goals."

ludekedesign is interested in the holistic aspect of seat design, starting with the human, without whom there would be no seat, and designing for actual comfort.


01

PARAMETERS OF COMFORT

Many aspects factor into the perception of a 'comfortable' seat. The first of these is the preliminary, split-second visual perception. "Heavily influenced by cultural as well as personal experience, this proves the most difficult to open to new definitions," says Ludeke. "One can visually determine a seat as comfortable, only to spend some time in it and find out that it is anything but. The reverse is just as true – a seat that visually doesn't conform to known parameters for comfort can prove to be exactly that over time."

Ergonomic studies, recommended angles, dimensions and geometries attempt to provide working tools to capture that elusive biological sense of comfort. "These, while based until now on traditional concepts of sitting (specific seat and backrest surfaces with

> THE PRINCIPLES OF ACTIVE SITTING ARE APPLICABLE TO ALL SEATING TYPES, WITH BENEFITS ESPECIALLY IN ECONOMY CLASS

defined geometric kinematics), serve to explain the impact of sitting on the body, and are a good point of departure to map out general aspects of seating geometries," says Ludeke. "As with many aspects in societies – especially in the western world – this quantifiable, scientifically gathered data is readily accepted as a benchmark."

But new developments in understanding exactly what transpires in the body have also emerged. A key idea is 'active' sitting, entailing both the conscious movement of the body to avoid prolonged immobility, and the subconscious movement that promotes blood flow and oxygen exchange on a molecular level while reducing the build-up of pressure points. "Recognised up until now primarily for medical applications (wheelchairs and hospital beds) and office seating, the principles of active sitting are applicable to all seating types, with benefits especially in economy class, where architectural and revenue parameters inherently limit physical movement," says Ludeke.

PSYCHOLOGICAL ASPECTS Ever growing, yet still underestimated, according to Ludeke, is recognition of the non-quantifiable psychological aspects of comfort perception. "The role of space in this is evident in the aircraft environment, and especially challenging in economy class," she says.

01. The Zest business-class seat concept, developed with Optimares
02. june s1, a seat for the VIP/ corporate sector

cross-pollination

"While independent seating studies show the aeras seat's ergonomic benefits, it is still visually perceived as being too different from traditional seating," says Christine Ludeke, principal designer at ludekedesign. "We underestimated how prevalent established visual notions of comfort are, but are seeing with time that this, underscored by positive sitting experiences, is changing. Two economy seat projects currently in development based on aeras further confirm its potential."

One of two additional offshoot projects is the fit lounge seat, produced by Interstuhl and released to market in April 2010. "Utilising the aeras principle in its most pure form – basically a knit surface that becomes a seat when one sits into it – it is changing the landscape of what a seat is in contract and home furniture," says Ludeke.

The company will present the other project based on aeras, an office chair, at Orgatec 2010. "We strongly believe in the synergy of everyday and onboard aircraft experiences," says Ludeke. "While celebrating what makes each its own unique experience, finding common denominators strengthens our perception of a product and its environment's value – especially when new archetypes are being proposed. In both the airline and home/office furnishings, the added benefit of the aeras principle is low weight (up to 2.5kg lighter per seat place) and simple construction."

03. The fit lounge seat, based on the aeras concept
04. The aeras aircraft seat

The pursuit of space – in terms of having some to oneself, being in control of it, and not having to inadvertently touch or be touched by a stranger – has led to benchmark research into how the perception of space is an important factor in the design but also layout of seats. Considering space in terms of confining it – a sort of 'I don't see you so you don't see me' mentality – has led to privacy solutions ranging from business class up to fully closeable personal compartments in first class.

"Psychological comfort factors go even further, incorporating the passengers' perception of how much they can customise the space," says Ludeke. This can range from the freedom of various sitting positions without being forced into a specific geometry, to a wholly intuitive interaction with the seat ('It does what I need it to do when I want, but I am not constantly confronted by options when I don't want them').

"In other words this involves intelligence, not only in terms of integrated electronic features, but in the use of materials – both new and traditional – and their inherent qualities to provide intuitive interaction between passenger and seat," says Ludeke. "Psychological comfort also can mean visual calmness and reduction of clutter – the less complex the visual surroundings, the more a passenger can project their own sense of space onto them."

THREE EXPLORATIONS

Three very different seat projects have allowed ludekedesign to investigate the various levels and applications of seat comfort. The aeras seat, developed with Greiner PURtec and Kobleder Knitting Technology, started with a blank sheet of paper. "The seat uses technically engineered knit instead of traditional cushions and covers, allowing the body unprecedented movement and continual support regardless of body size or position within the restrictions of economy-class, as well as an optimal microclimate," says Ludeke. "Through an iterative process working with the material on various full-scale seat structures, we were able to discover how to work with its properties and engineer a specific series of zones within the material that work together to create the necessary function."

The Zest seat concept, developed in collaboration with Optimares, looks at comfort in the context of a premium business-class environment. The psychological and functional aspects of interaction with travelling companions or when alone were primary points of departure. "Being able to share the table or be reminded of inadvertently left items in the stowage areas are just two comfort interactions that developed out of this approach," says Ludeke.

With the june s1 seat for the VIP/corporate sector, ludekedesign looked at "interpreting the modern elegance of lightness as an expression of comfort" according to Ludeke. "This is combined with a new type of kinematics that offers lounger-like physical comfort and unsurpassed seat travel capacity, expanding personalised movement and offering new combinations in lounging, eating and conferencing," she says.

While each project addresses its specific goals, the company says they offer cross-pollinating potential. "This is vital to the future of aircraft seating, and encapsulates that which excites us," says Ludeke. ☒

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the [ ] important thing about design is how it relates to people

victor papanek

ludekedesign

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designdirectory

ACUMEN DESIGN ASSOCIATES

LOCATION: LONDON, UK
FOUNDED: 1981
EMPLOYEES: UNDISCLOSED
EXPERIENCE: Following the invention of British Airways' 'bed in the sky' in 1996, Acumen has worked with more than 20 leading airlines, including American Airlines (first-class swivel seat); Air France (L'Espace first class); Air Canada (business class); Cathay Pacific (first class); Korean Airlines (first class Kosmo suite); Etihad Airways (A380 – all classes) and Delta Airlines (business class).

ALTITUDE AEROSPACE INTERIORS LTD

LOCATION: AUCKLAND & CHRISTCHURCH, NEW ZEALAND
FOUNDED: 2008 (FORMERLY AIR NEW ZEALAND ENGINEERING SERVICES)
EMPLOYEES: UNDISCLOSED
EXPERIENCE: Premium cabin integration and design for airlines including Air New Zealand and V Australia, as well as BBJ maintenance and refurbishment.

FACTORYDESIGN

LOCATION: LONDON, UK
FOUNDED: 1997
EMPLOYEES: 10
EXPERIENCE: Factory's portfolio of airline clients includes British Airways (Concorde, Club World Kitchen, World Traveller Plus), Etihad Airways, Jet2.com, Singapore Airlines and Virgin Atlantic. It has also helped design seats direct with suppliers.

HONOUR BRANDING

LOCATION: LONDON, UK
FOUNDED: 2004
EMPLOYEES: 5
EXPERIENCE: Key clients include bmi, Etihad Airways and Saudi Arabian Airlines. Honour's partners previously worked as marketing professionals at British Airways and Futurebrand.

IDS HAMBURG
LOCATION: HAMBURG, GERMANY
FOUNDED: 1984
EMPLOYEES: 7
EXPERIENCE: A wide range of design concepts, from sports utility-inspired interiors for very light jets to regional jet interiors (ARJ21, CRJ 900X) through to extensive work for Airbus.

JPA
COMPANY NAME: JPA
LOCATIONS: LONDON, UK; SINGAPORE
FOUNDED: 1982
EMPLOYEES: 30
EXPERIENCE: JPA's airline customers include Singapore Airlines (first class, business class and first-class lounge); Japan Airlines (JAL Suite); US Airways (Envoy Suite); and interiors and branding for Gulf Air.

LUDEKEDESIGN
LOCATION: ZURICH, SWITZERLAND
FOUNDED: 1994
EMPLOYEES: 2
EXPERIENCE: Airline clients include Swissair (product design, including award-winning dishware and cutlery); Singapore Airlines (Spacebed); Finnair (interior design); and numerous projects with leading suppliers.

MÜLLER/ROMCA INDUSTRIAL DESIGN
LOCATIONS: HAMBURG & KIEL, GERMANY
FOUNDED: 1993
EMPLOYEES: 7
EXPERIENCE: Lufthansa (A380 first-class bathrooms; 747 first-class cabin; 747-8i first-class bathrooms); and lavatory design for Airbus' long-range fleet, including standard lavatories for the A380. It has also designed interiors for Siemens' Velaro high-speed train and the Hamburg-Cologne Express.

PATRICK LINDON INDUSTRIAL DESIGN
LOCATIONS: ZURICH & BASEL, SWITZERLAND; LONDON, UK
FOUNDED: 1990
EMPLOYEES: 3
EXPERIENCE: SWISS (A340-300; A330-300; and A320) and various (confidential) projects for subsidiaries of the Lufthansa Group, and seat manufacturers in the UK and Europe.

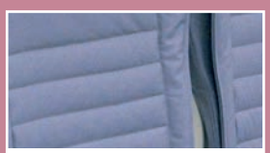
PEARSONLLOYD
LOCATION: LONDON, UK
FOUNDED: 1997
EMPLOYEES: 12
EXPERIENCE: Virgin Atlantic Airways (Upper Class Suite, premium economy, economy); Lufthansa (business class); and consultant to Transport for London (TFL).

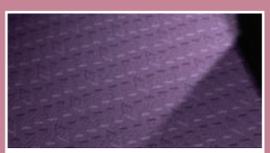
PIERREJEAN DESIGN STUDIO
LOCATION: PARIS, FRANCE
FOUNDED: 1980
EMPLOYEES: 15
EXPERIENCE: Emirates (first class mini-suites and showers); Qatar Airways; Etihad (business class); and numerous VIP/head-of-state wide-body projects and mega yacht interiors.

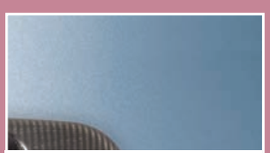
PRIESTMANGOODE
LOCATION: LONDON, UK
FOUNDED: 1986
EMPLOYEES: 25
EXPERIENCE: Clients include Airbus; Embraer; Jet Airways; Kingfisher Airlines; Lufthansa; Malaysia Airlines; Qatar Airways; SAS; SWISS; TAM Airlines; Turkish Airlines; and Virgin Atlantic.

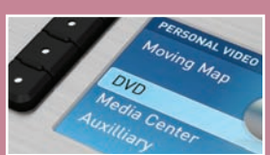
SEYMOURPOWELL
LOCATIONS: LONDON, UK; SEOUL, KOREA.
FOUNDED: 1984
EMPLOYEES: 83
EXPERIENCE: All aspects of transportation design, including automotive design and production and conceptual projects in the light and high-speed rail markets, as well as production and conceptual projects for the aerospace market.

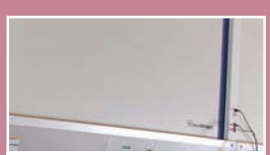
TEAGUE
LOCATION: SEATTLE, USA
FOUNDED: 1926
EMPLOYEES: 200
EXPERIENCE: Teague's project list is extensive, including 787 Dreamliner, 747/747-8 and 737/Next Generation interiors; Emirates 777 Door 1 Entry & first-class cabin; V-Australia 777 premium bar areas; Stratocruiser and 707 interiors; Soutwest Airlines (carpet); and the design of Panasonic's Integrated Smart Monitor.

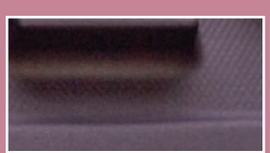












SUPPLIERSHOWCASE

sixthsense

Aviointeriors offers airline seats in six specific cabin classes, all optimised for airline economics and passenger comfort

01. The stand-up seat concept, SkyRider
02. Sapphire, a long-range economy-class seat
03. The Sleeper Seat from 1982
04. TechnoComfort seat from 1998

From airlines to the world's media, the launch at the Aircraft Interiors Americas Expo in September 2010 of Aviointeriors' SkyRider, an ultra-high-density stand-up seat concept, has created enormous interest. The seat is designed to take up less space than classic high-density seating, and can be configured with a pitch of 23in, or less with partially overlapping rows.

"Complaints about reduced space have quickly been overshadowed by the potential benefits this new concept is bringing to airlines and passengers," says Dominique Menoud, director general of Aviointeriors. "For the airlines this seating arrangement will enable them to provide a more dedicated service for the other classes and offer them a more sound financial return, while for passengers SkyRider will bring a much-reduced fare structure."

Aviointeriors however, has many more strings to its bow – with offerings in all other seating classes, namely economy, premium-economy, business, first and super-first suites. The company's roots date back to the early 1970s, when it could already boast collaborations with some of the world's most renowned industrial designers, including Lenci, Mattu, Vagnoni, Giugiaro and Bertone.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DEVELOPMENT As well as working with leading design houses, the company's in-house style and design department, in close collaboration with the research and development division, devotes large resources to researching the use of materials and technologies for aircraft seating.

Following the research stage, ergonomic and formal checks are performed on the product in the prototyping and modelling laboratory. Making prototypes and models allows adjustments to be made, and is part of the company's commitment to offering the customer a personalised and complete service.

An in-house static and dynamic testing facility and continuous cycling for fatigue testing all feed into the

> THERE ARE NO RESTRICTIONS ON TECHNOLOGICAL CREATIVITY, EXCEPT THOSE IMPOSED BY THE DESIGN ITSELF

quest for highly reliable products. Aviointeriors' facilities also include an advanced composite technology centre. This also benefits its rail interiors division, which specialises in technology and interiors for high-speed trains. "Thus, there are no restrictions on technological creativity, except those imposed by the design itself," says Gaetano Perugini, research and development director at Aviointeriors. "This is experienced in each and every one of our projects."

Since its inception, Aviointeriors' has set out to be a trendsetter. "Aviointeriors has always been the first to propose concepts to its customers that they didn't even know they wanted," says Menoud.

SETTING TRENDS Among its first seat breakthroughs were the economy-class Europa in 1974 – the main innovation of which was a backrest hinge that corresponded to the armrest hinge – and its sister in 1975, the convertible America seat.

Then in 1982, Aviointeriors launched the Sleeper Seat, designed for CAAC as a standard first-class seat

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05. Ruby, a first-class swivel seat
06. Gentle Slope, a business-class seat

for the airline's entire fleet of wide- and narrow-body aircraft.

Another highlight was the Espace 2000 in 1988/89, an avant-garde business-class seat customised with an adjustable headrest for Air France's long-range fleet, initially only with adjustable ears, and the year after, with a three-way mechanism.

Also in 1989, the company launched Shuttle 390, an economy-class seat certified to 16g dynamic standards. Aviointeriors estimates that over 100,000 of these seats are still in service, in five continents.

In 1994, the company launched the appropriately named Chameleon, a seat that could convert from business to economy class, and from six to five or four passengers per row. This was achieved through a telescopic device via an endless screw system.

The 1990s also saw the unveiling of a cradle comfort recline mechanism in 1995; the lie-flat business-class seat Eva for Singapore Airlines in 1998; and in 2006, a collapsible seatpan nose for long-range, economy-class seats, designed for Lufthansa and certified for the A380.

More recently, in 2006, Aviointeriors revealed an ultra-slim backrest with a fabric suspended cover, which eliminates the need for conventional cushioning. Also worthy of mention in this 'hall of fame' are Gentle Slope, designed to improve comfort while reducing weight; Sapphire, which has a movable seatpan that adapts to passengers' posture for long-range comfort; UltraLight Plus, the structure of which follows the lower cushion profile at variable distances in accordance with the requested foam thickness; and the company's most recent first-class seat, Ruby.

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NEW ADDITION However, at the 2011 Aircraft Interiors Expo in Hamburg, Germany, Aviointeriors will premiere a new first-class seat, DeckChair. "The DeckChair will take first-class seating to a new and unparalleled level with features unheard of today," says Menoud. DeckChair features an adjustable multifunctional desk for stowage and other passenger uses. Special attention has also been paid to the seat's position, and height from the cabin floor.

"In a market that is more and more demanding, new products, new materials, and new features are being studied every day," says Menoud. "Throughout the six seating classes Aviointeriors' customers can find beautiful, innovative and personalised seating products – a winning argument for airline economics and passenger comfort." ☒

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A Winning Argument - From SkyRider To SkySuite

SkyRider

UltraLight Economy class

Economy class

Premium economy class

Premium economy class

DeckChair - New First Class Seat Concept launch at
Aircraft Interiors InternationalExpo 2011, Hamburg

Business class

Frist class

SkySuite

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magictriangle

For Recaro there are three aspects to consider when developing a successful aircraft seat – weight, comfort and space

To reduce fuel consumption, airlines are looking for more ways to reduce weight in aircraft interiors. But Recaro Aircraft Seating says weight is not the only milestone on the road to successful seating concepts – passenger comfort and increased living space also play an important role. In 2010, the aircraft seat supplier launched various products designed to meet these challenges.


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REDUCING WEIGHT Weighing only 9.1kg, the SL3510 is currently one of the lightest economy-class seats on the market. "We managed to significantly reduce the weight of the seat," says Axel Kahsnitz, CEO of Recaro Aircraft Seating. "This was achieved by integrating high-tech materials and intelligent designs." Instead of conventional foam inside the seat, a netting material is used to form the core of the backrest. Recaro says this makes it possible to reduce foam thickness and to make the backrest much lighter. The company received a Crystal Cabin Award in 2009 for this weight-optimised concept.

The SL3510 seats went into service in late January 2010 when Air France retrofitted 6,000 seats on its short-range fleet of 37 A319, A320 and A321 aircraft. Recaro estimates that the SL3510 is 40% lighter than the airline's previous seat model, while Air France says this saves 1,700 tonnes of jet fuel each year and lowers its CO_2 emissions by 5,200 tonnes.

For Dr Mark Hiller, COO at Recaro Aircraft Seating, lowering weight is only one of the key trends in the aviation industry. "As aircraft seat designers, our focus is on the magic triangle of weight, comfort and increased passenger living space," he says. "All three of these factors play an important strategic role in the highly competitive air travel market. Airlines are demanding lighter seats. At the same time, they want to

> AIRLINES ARE DEMANDING LIGHTER SEATS. AT THE SAME TIME, THEY WANT TO GIVE PASSENGERS MORE LIVING SPACE AND ADDED COMFORT

01. Qatar Airways was the first customer for the CL3620 long-range economy-class seat

02. The economy-class SL3510 seat
03. The premium-economy PL3510 seat

give passengers more living space and added comfort."

According to Hiller, airlines also have high expectations when it comes to seat durability. "The airlines are placing more emphasis on product reliability," he says. "Their focus is on the cost of a seat across its entire lifecycle. With this in mind, good quality definitely pays off."

IMPROVING COMFORT The fact that lightweight construction and comfort are not mutually exclusive concepts is demonstrated by Recaro's current economy-class portfolio. The SL3510 is designed to offer exceptional comfort on short-haul flights. To achieve this, Recaro's engineers focused specifically on the seat's ergonomic qualities. The backrest angle is set at 15° for a relaxed seating position and the netting on the aluminium frame conforms to the shape of the passenger's spine. Compared to the seats previously used by Air France, Recaro says the SL3510 provides up to 7.5cm more room. "How is this possible? It's very simple," says Hiller. "Our netting material makes the backrest much slimmer and increases the distance between rows."

Meanwhile the CL3620 is optimised for ultra-long-range flights of up to 20 hours. The seat's single-beam concept, slim silhouette and ultra-thin backrest are all designed to maximise legroom for passengers, even at a relatively short seat pitch. Other comfort features include flexible materials in the headrest, and a foot net.

In 2010, Recaro presented the CL3620 at the Aircraft Interiors Expo in Hamburg, Germany. "Our product strategy with its focus on design and comfort is right on track, this was confirmed by the Crystal Cabin Award 2009, as well as by our customer orders," says Kahsnitz.

Recaro gained Qatar Airways as the first customer for its CL3620 model. The airline ordered several thousand seats for its fleet. Several other premium carriers followed, ordering the seat for their fleets.

Then there is the Skycouch, a trio of three economy seats for long-haul flights that together create a flexible space when the ergonomic legrests are folded up 90°. "With the Skycouch we intended to go one step further, offering even more passenger comfort in economy class," says Kahsnitz. "Stretching out on long-haul flights should no longer be a privilege reserved for business or first class."

The company developed the seat based on an idea from Air New Zealand. "The challenges involved with the Skycouch were widely varied and extremely demanding. The final result reflects a successful overall concept attracting a lot of attention," says Kahsnitz. The seat features a newly designed backrest in lightweight, high-tech materials with matching armrests that can be easily folded away when the seats are configured for sleeping. The

> "STRETCHING OUT ON LONG-HAUL FLIGHTS SHOULD NO LONGER BE A PRIVILEGE RESERVED FOR BUSINESS OR FIRST CLASS"

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new seats are due to take flight on Air New Zealand's long-haul services to Los Angeles via London from April 2011.

MAXIMISING SPACE As premium-economy class continues to gain market popularity, seat developers are faced with the task of developing seats offering not only more comfort but also much more room – factor three in the triangle. Recaro's PL3510 has been developed to bridge the gap between economy and business class, with a seat pitch from 36-40in, up to 9in recline, a legrest, and a greater seat width. "The distance between armrests on an economy-class seat is up to 17.5in. The PL3510 features a wider, 19.5in seat width," says Kahsnitz. "We successfully launched the PL3510 on the market and the demand is steadily growing." Qantas Airways uses the seat in its A380, B737, B747 and A330 aircraft. Other PL3510 customers include British Airways and Alitalia. "It is not only airlines in Australia, New Zealand and Europe that are fascinated by the seat – it is also attracting a lot of attention in Asia," says Kahsnitz.

THREE IN ONE Recaro says all three factors – lightweight construction, enhanced comfort and more space – are combined in its CL5510 model for business class. "What makes this seat so special compared to today's standard products is the new shell designed for seat pitches from 42-45in," says Kahsnitz. "This makes it possible to adjust the seat to any position without disturbing neighbouring passengers."

Not a short-haul model based on economy-class seats, nor a long-haul full-flat bed seat, the CL5510 brings a fixed shell concept to the medium-haul segment. The kinematic system with dual actuators is based on the patented kinematics of Recaro's CL6510 seat. Passengers can simply press a button and adjust the seat to one of the pre-programmed positions. For a relaxed position, the seat pan slides forward, the footrest is raised and the backrest reclines. The seat is designed to maximise available space so that passengers can stretch out their legs under the seat in front of them. Recaro says this makes it possible to reduce seat pitch without sacrificing passenger space. The company also believes the seat weighs less than conventional business-class models. "Our seat concept is an ideal solution for the medium-range, business-class cabin," says Kahsnitz. "For some carriers it might also work as a high-end, premium-economy-class seat."

Although it has successfully launched various products onto the market in 2010, Recaro says this is no reason to sit back and relax. "We have many new ideas in store for the near future," Kahsnitz promises. Its next innovations within the 'magic triangle' will be demonstrated by the company at the next Aircraft Interiors Expo in 2011 – aiming to bridge the gap between maximum comfort and optimal space utilisation, all in a light-weight package, of course. ☒

04. The CL5510 model for medium-haul business class, based on a fixed shell concept

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oneforall

With ongoing updates and orders for aircraft ranging from a turboprop to an ACJ, Rockwell Collins' Venue cabin management system has broad appeal

01. Venue is a CMS for all types of business jets

At the 2007 NBAA Annual Meeting and Convention in Atlanta, Georgia, USA, Rockwell Collins introduced its new concept for business aviation cabin management systems (CMS) – Venue. Incorporating high-definition home theatre capabilities, support for personal and portable electronic devices, enhanced mobile office services, connectivity, and full cabin environmental controls, Venue represented one of the first fully high-definition CMS to be selected for new production aircraft. The system embodied a renewed emphasis on modern capabilities, industrial design, scalability and affordability.

"As we assessed the CMS landscape, we realised there were significant opportunities within the market, in particular addressing the emergence of high-definition and digital media, and for a system that could scale the wide range of business aviation aircraft sizes and application," says Andrew Mohr, part of Rockwell Collins' Venue product marketing team. "In the end, we brought together our diverse range of cabin experience while adopting an unprecedented number of new and emerging consumer trends and technologies into one unique system."

THINKING SMALL Despite Rockwell Collins' traditional strength in the large and VVIP aircraft cabin market, Venue had its debut at the other end of the spectrum – in light jets and turboprop aircraft. A combination of market timing and customer requests meant the earliest OEM awards for Venue were on the King Air 350i turboprop and the Cessna CJ4, a light jet.

The company says that at that time, the light jet market was a rapidly expanding segment, and light jet manufacturers were recognising the need to provide a premium cabin experience to distinguish their offerings. As a result, the entry via the small aircraft market brought a unique opportunity for Rockwell Collins to deliver on one of its original goals for Venue – to span the entire business aviation market. "Without a doubt, one of the greatest benefits of addressing the small aircraft market first has been an emphasis on size, weight and affordability, while still bringing to market state-of-the-art high-end capabilities," says Mohr. "The challenge of putting premium systems into smaller cabins allowed us to achieve a real breakthrough in these areas, ensuring Venue would be cost-, weight- and price-competitive as we eventually moved up the market."

TAKING FLIGHT After two years in development, Venue entered into service in early 2009 on both the Cessna Citation CJ4 and Hawker

> VENUE IS OUR FIRST CMS BUILT PURPOSELY TO ADDRESS THE AFTERMARKET AND VVIP CABINS, IN ADDITION TO OUR TRADITIONAL OEM FOCUS

02

02. A CMS controller

Beechcraft King Air 350i. Rockwell Collins considers these certifications two of its most successful CMS entries into service ever in terms of performance and customer reaction. As of October 2010, there were nearly 40 Venue-equipped aircraft in service.

Beyond the successful delivery of Venue to the market, the system has been recognised by the international design community. Within 2009 alone, Venue won three distinguished design awards – a red dot design award, a Good Design Award and a 2010 International Forum (iF) Product Design Award.

"We could not be happier with this recognition," says John Hill, senior director of business jet products for Rockwell Collins' Cabin Systems business unit. "These awards are bestowed upon companies ranging from global consumer electronics brands to home furnishing artisans. To see Venue stand up with the best innovators and design centres of the world – not just within aviation – is a real validation of our emphasis on best-in-class design in terms of aesthetics, usability and technology."

NEW ADDITIONS Recognising that being first can be a fleeting advantage, the Venue development team has continued to focus heavily on new additions to the solution, and expanding Venue from an OEM product line to a solution for the substantial aftermarket for cabin upgrades.

"Venue is our first CMS built purposely to address the aftermarket and VVIP cabins, in addition to our traditional OEM focus," says Lupita Ho, principal marketing manager for Rockwell Collins. "We have specifically designed easy configurability into the system to enable dealers and modification centres to quickly and affordably tailor Venue to their individual customer completions."

A great part of this focus has been the development of Venue Tools, a suite of web-enabled quote and configuration tools for Venue's aftermarket customers. "Our suite of Venue tools changes the game for how a CMS can be built to enable a market," says

03. A cradle for passenger's iPhones
04. Rockwell Collins' facility in Tustin, California, USA

Ho. "One thing we learned from our customers is that quick, reliable and affordable configuration of the CMS was essential to successfully transition our product to the aftermarket."

As a result, Rockwell Collins formally introduced Venue as an aftermarket-ready CMS in the spring of 2010. "The Venue CMS, support tools and our quote and support organisations have all been aligned to ensure we offer a premiere CMS solution to the cabin aftermarket," says Ho.

> IN 2011, WE WILL DEBUT A NEW GENERATION OF IN-SEAT INTERACTIVE CAPABILITIES – IT'S AN EXCITING TIME

The effort has been rewarded with the company winning a growing number of aftermarket installation awards. The two most recent and significant in scope and size include contracts for an Airbus Corporate Jet (ACJ) retrofit from Jet Aviation, and a B757 from Tenencia. In addition, Venue has been retrofitted in aircraft ranging from the Hawker 400XP to the Gulfstream 450.

These new contracts would appear to validate the broad applicability of Venue. Chosen for aircraft ranging from a turboprop to an ACJ, and fully capable for everything in between, Venue has, within only three years of its first announcement and within one year of entry into service, achieved its stated goal as being Rockwell Collins' premiere CMS platform for all aircraft type and configurations.

This broad market applicability is not just in terms of aircraft size, but the variety of configurations that both OEMs and modification centres wish to offer their customers. "We have customers who wish to offer cabins that include all possible entertainment and office capabilities, and those wishing to simply support the use of personal carry-on devices, like the iPad," says Mohr. "For each of these emerging technologies, we believe we can provide an ideal solution. We have even developed Venue configurations that are 'iPad centric', if you will, recognising the importance of these devices in the end-users' lives."

Rockwell Collins continues to increase its features list for Venue. The most recent additions have been an expanded range of seat and bulkhead displays, a new dual-disc Blu-ray player, an iPod Touch and iPhone cabin remote application with integrated Airshow map feature, and large galley touchscreen controllers. "And in 2011, we will debut a new generation of in-seat interactive capabilities – it's an exciting time for cabin innovations," says Mohr.

Rockwell Collins has also opened the Venue platform to third-party suppliers, to bring in a broader range of capabilities. "Our recent announcement of Rosen as our preferred aftermarket display supplier is the first example of this approach," says Ho. "We will be working with a number of cabin partners over the coming months to ensure these capabilities are fully integrated and performance optimised for a Venue cabin."

EXIT MUSIC It is easy to see that the Venue development team at Rockwell Collins has kept a demanding schedule over the past three years, though most would describe it as a labour of love. "We are passionate about this business," says Mohr. "Many of us who work on the Venue development are serious enthusiasts of consumer technology, and we may even be accused of being 'tech geeks' by some. But that's OK with us. We know this affinity results in an exceptional CMS, and more importantly, exceptional passenger experience. We are excited about what we have delivered to date, and the new innovations we will continue to deliver in the near future." ☒

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UPGRADE TO VENUE.™ Every day, people around the world count on Rockwell Collins to help them be as productive in the air as they are on the ground. Our Venue cabin management system transforms your aircraft into a high-tech business center with access to real-time information and support for portable devices such as your smartphone. And when it's time to relax, you can view movies and other digital content on high-definition wide-screen displays, listen to your music, or dim the lights and enjoy the ride. All at the touch of your finger. Let us configure the perfect Venue for you.

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onthesamesheet

How Kydex collaborated with designer David Scott to push the boundaries of thermoplastic sheet design

Kydex says the aviation industry's understandably stringent regulations and seat suppliers' production requirements have made it challenging to produce unique effects on thermoformed components for aircraft interiors, limiting the ability of designers to create environments that delight and soothe passengers. Accordingly, Kydex and international designer David Scott joined forces to revolutionise the way airline designers approach this often neglected but important part of aviation interior design.

Kydex is a global leader in manufacturing thermoplastic sheet for aircraft cabin interiors, aiming to deliver aesthetics, high performance, durability and regulatory compliance. Scott is a world-renowned stylist selected to the position of interior designer on a team charged with redesigning the complete interior brand experience of a major airline.

As Scott embarked on his design project, he received a box from Kydex containing a large number of colour samples. Upon contacting Kydex, he learned the colours he liked were not available in aviation-compliant material. Although Kydex offered its colour matching process and developed some additional colours, the proposed solutions were not exactly what he envisioned to achieve the dreamy, cloud-like environment that would help differentiate the airline's new fleet of B777-300s. Initially frustrated, Scott realised there was an opportunity to influence a supplier to develop the product he desired.


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THE CHALLENGE Kydex offers a virtually unlimited number of colours for its thermoplastic sheet, which is used to form airline seat shrouds, tray tables, IFE components, monument parts, galley components and other

> ‘NO’ IS NOT IN OUR DNA – WE ARE PROUD OF OUR HERITAGE OF INNOVATION AND ABILITY TO DELIVER MORE THAN WHAT OUR CUSTOMERS CAN IMAGINE

01. The result of the collaboration was a new material, Kydex 6503

items. In some cases, a unique colour or effect can only be achieved by applying a film to the thermoplastic sheet substrate. “The drawbacks of this approach are that the material has limits in how complex a shape it can be formed into, and the final product is less durable and difficult to repair when it gets damaged,” says Ronn Cort, international business manager at Kydex. “With the high cost and time required to repair interior components, designers and seating suppliers instead utilise more readily available and easy to fabricate materials and colours. However, aircraft interior designers are increasingly looking for exciting ways to create premium environments for today’s sophisticated travellers. New lighting systems also allow designers to play with reflection and metamerism to create environments that change throughout the flight’s duration – particularly during long-haul flights.”

Scott does not believe in things being ‘impossible’. From helping an airline rethink its customer experience, to transforming an airline’s lounge into a world-class club, Scott is known for tackling things others consider too challenging. When Kydex invited him to tour its plant in Bloomsburg, Pennsylvania, USA, he embraced the opportunity to see its manufacturing process first-hand, to determine how they could work together. Scott was so impressed that he committed himself to working with Kydex to solve his design dilemma.

Likewise, Kydex was inspired by the chance to work with Scott. “We were intrigued that a designer of David Scott’s stature was looking for something Kydex didn’t offer,” says Cort. “‘No’ is not in our DNA – we are proud of our heritage of innovation and ability to deliver more than what our customers can imagine, so we knew we had to take action.”

> THINK ABOUT WHAT YOU WANT, THEN WORK WITH SUPPLIERS TO HELP MAKE IT COMPLIANT

company profile

Kydex is a US-based manufacturer of proprietary thermoplastic sheet products marketed worldwide under the trademark Kydex. The company's headquarters, major manufacturing operation, customer service, and research and development facilities in Bloomsburg, Pennsylvania, are certified to the ISO 9001 quality management system and the ISO 14001 environmental management system. Technical service, customer service, and sales representatives worldwide provide technical advice on designing and manufacturing components with Kydex sheet products.

02. Scott and Kydex developed 28 colours for the new material
03. The full collection in flat samples with original fabric swatches for matching


02


03

SIDE BY SIDE Embarking on a three-month collaboration, Scott and Kydex lab technicians worked side by side to develop a new material that had the aesthetic effect incorporated into the raw material, rather than in a more traditional film cap. Since Kydex sheet can transform into different colours and gloss when heated, Scott says designers shouldn't make decisions based upon a flat sheet – they need to see how the material will respond in different forms. "I want to create one look for the back of a seat – it needs to reflect light as a passenger approaches – but I want a different experience as the passenger is resting in the seat," says Scott by way of example. "I don't want the light to bounce around the occupant's face, so the headrest needs to envelop and soothe the passenger. The traveller should emerge from the flight feeling delighted about his experience on the aircraft."

Scott was personally involved in the development of the new material on a daily basis. Independent third-party laboratories verified that the product met the performance properties of Kydex sheet and was compliant with FAR 25.853(d) smoke development and 65/65 heat release requirements. The final result was an ethereal pearlescent colour that is not white, not silver, but has violet undertones – exceeding even Scott's demanding design ideals. The material was called Kydex 6503, since it combines the properties of the existing aviation-compliant line Kydex 6500 with pearlescent qualities. Designed to be more subtle and refined than a metallic, the new material reflects and refracts light, also making scratches less noticeable, says Kydex.

Cort and Scott agree there can be significant benefits to suppliers collaborating with designers – they say that by working together they can resolve issues involving cost, lead time, compliance, weight constraints and passenger comfort and satisfaction.

EARLY BIRD BENEFITS Cort also anticipates that early collaboration with designers can play a role in helping seating companies and airlines contain their costs. "It can cost as much as US$100,000 to make a material change after seat certification, so it makes sense for designers and suppliers to work together from the inception of the design," he says. "Only by understanding the client's wishes can a material be developed to meet the regulatory, production, cost and design specifications."

Scott and Kydex have continued to collaborate on a collection of 28 colours in this new material. Scott is optimistic this successful collaboration will encourage other designers to reach new heights. The lesson to designers, says Scott, is to "Think about what you want, then work with suppliers to help you make it compliant. I hope my experience inspires other designers to work with suppliers like Kydex to develop the kind of products that provide travellers with a new level of experience and makes them feel great about their journey". ☒

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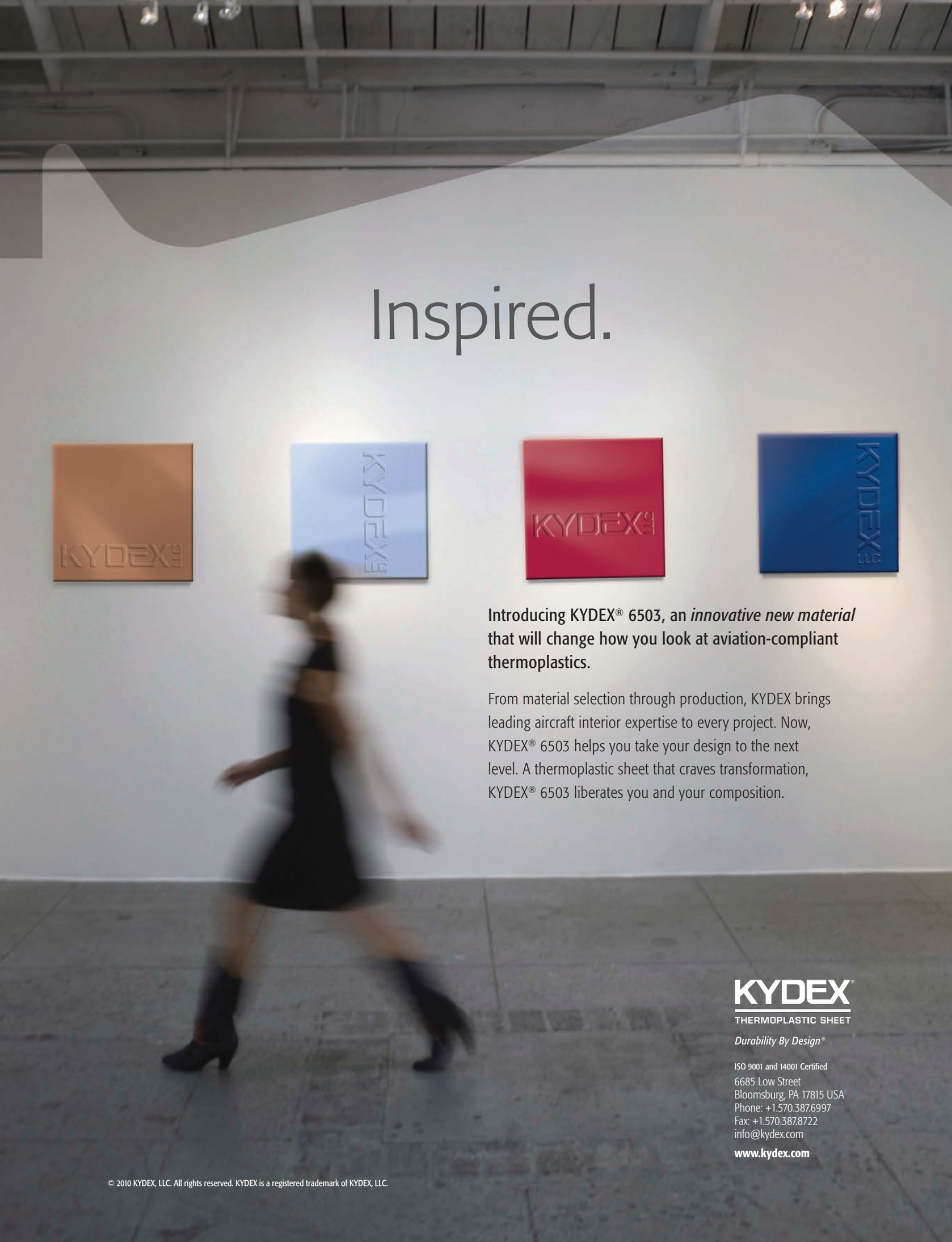
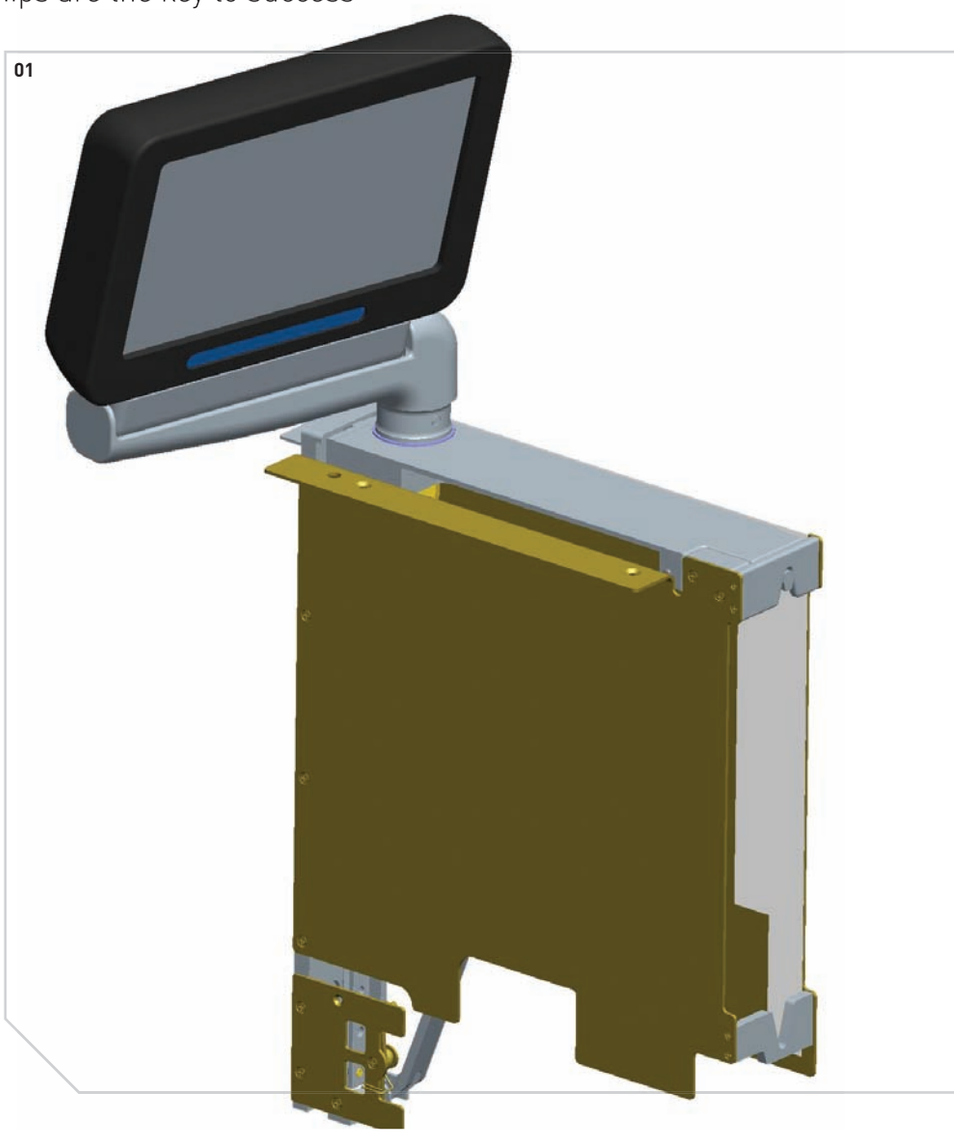


balancingact

With almost two decades' experience in IFE deployment systems, Bucher Aerospace says innovation must go hand in hand with standardisation; and partnerships are the key to success



01. A pop-up IFE deployment system

Since the early 1990s, when Bucher Group was approached to produce its first IFE deployment systems, the company has established a healthy track record as a video arm development partner for the commercial aircraft seating and VIP sectors. "In the intervening years, the continuing development of flat-screen technology has driven a sea change in the IFE market," says Stephen Court, dirtector of engineering at Bucher Aerospace. "As in many industries that cater to consumers, features that were once considered a luxury soon come to be expected as standard. Reliable, aesthetically appealing monitors of larger size and with more and more on-demand content are now the norm throughout the cabin, and particularly on long-haul routes."

As IFE systems have evolved, so have the seat and cabin products in which they are installed. "The demand for more features, higher levels of comfort, greater ease of use, improved aesthetic appeal and better reliability has continually risen, resulting in a wide range of unique solutions being launched," says Court. "As the physical interface between the IFE system and the seat or cabin furniture, Bucher Aerospace recognises that its video arm products must develop in a similarly innovative and constant way. With this approach the company aims to blend the entire system seamlessly into one appealing homogeneous product."

SIMPLE YET EFFECTIVE

At the start of Bucher Aerospace's journey towards becoming a key supplier of IFE deployment arms, it developed a drawer-style front deploying unit. This design accommodated a small screen and allowed the passenger to de-latch the mechanism by pushing on the top of the screen, and then sliding and rotating it into the viewing position.

"The simplicity of operation, robustness and reliability of this design proved to be extremely popular and has set the tone for all Bucher Aerospace's future deployment arm developments," says Court. "Over time, as screens have enlarged and available space has diminished, the basic concept of this deployment arm has been effectively adapted to suit, leading to many of these derivative units still going into service today."

The myriad of new furniture and cabin designs in recent years has prompted the creative juices to flow at Bucher Aerospace in response. This has led to the development of a comprehensive range of deployment solutions now offered by the company, tailored to a variety of applications. For economy and premium-economy classes for instance, the company offers various derivatives of its front-row arms. These arms are modular and customisable for

> AUTOMOTIVE STANDARDS OF AESTHETICS, EASE OF USE, INTUITIVENESS, RELIABILITY, TACTILE FEEL, TOUCH POINTS AND NOISE ABATEMENT ARE TYPICALLY EXPECTED


02


03

02. A front-row solution
03. Built-in deployment sequencing logic ensures the arm deploys in a set way

the specific application and can be produced with the capability to remove and replace the fully terminated IFE cable. Meanwhile as new models of aircraft such as the B787, A380 and A350 have been launched, the company has been presented with the challenge of installing a larger 12.1in smart monitor onto a front-row arm while automatically avoiding contact with the sidewall and other obstacles throughout the deployment sequence. This led to the development of built-in deployment sequencing logic, which allows the rotation of certain joints only at the desired point during deployment and stowage.

Other variants successfully brought into service by the company include arms that rotate from the console (both from the front and the top of the furniture), pop-up deployment units, VIP sidewall-mounted arms and crew-rest arms.

ON THE MOVE The company says it would be foolish to stand still. "The industry and the market move on, and the expected product standard continues to increase," says Court. "Automotive standards of aesthetics, ease of use, intuitiveness, reliability, tactile feel, touch points and noise abatement are typically expected throughout the passenger experience. Greater functionality is also continually being explored, for instance to incorporate passengers' personal media devices and content. Adding to the challenge is the heightened economic pressures faced by both airlines and the general public, requiring all of these product developments to be incorporated at competitive prices and with fuel-saving weight reductions."

With its IFE deployment mechanisms at first glance being a relatively

04

04. A tube-style deployment arm

> THE PRODUCT DIVERGENCE THAT INNOVATION HAS CREATED IS BEING ADDRESSED TO BRING DOWN COSTS, WEIGHT AND TIME TO MARKET

small part of a greater system, one could be forgiven for underestimating the part that Bucher Aerospace has to play in the overall goal of offering continual innovation to the consumer. However, the company does not see it that way. It has the challenge of bridging the gap between the cabin furniture and the IFE system, with a highly interactive part of the system. Current processes are in place and future developments are being dreamed up to meet the challenge.

There are two main thrusts to the Bucher Aerospace approach – a continual product improvement cycle and the concept of partnership. There are multiple ways in which these ideas are addressed, and these methods are being improved and augmented constantly. The company is acutely aware that the market will not accept products that do not keep pace with its demands. A continual improvement cycle ensures that innovations are offered to the market after careful study and evaluation. For example, the company says that new materials are being researched with the potential to improve not only the low weight of units, but also the feel and ease of operation, noise-deadening properties and overall stiffness characteristics. Entirely new concepts are also under development that the company hopes will provide passengers with fresh new ways to experience the journey.

STANDARDISATION Meanwhile, from a more immediate standpoint, the very product divergence that innovation has created is being addressed to bring down costs, weight and time to market. "As the range of units available has expanded over time, and as individual customer requirements for these products has necessitated navigating certain design avenues, commonality and standardisation are incrementally lost," says Court. "Periodic and thorough engineering review of the product range can, with careful attention to future market expectations and variability, yield significant gains in modularisation and standardisation of mechanisms and parts."

Such improvements, the company believes, provide customers with the joint gains of cost reduction and lead-time reduction. "Standard parts reduce costs through economies of scale, while thoughtful modularisation allows customer requirements to be anticipated, providing configurable products that can meet those requirements without a major investment in design time and cost," says Court.

Meanwhile, the idea of partnership is embedded in the mission of Bucher Aerospace. "Every day personnel live this concept through relentless dedication to customer service, and through highly disciplined programme management communication procedures," says Court. "Effective as these habits are, much more can be done. The company networks throughout the development chain continually – from industrial design consultants through to seat manufacturers, completion centres and airlines – to identify collaboration opportunities with mutual gain for all parties."

Where the goal is to envisage, develop, manufacture, certify and deliver the best possible product for the flying customer, Bucher Aerospace seeks to engage in the process as early as possible to ensure that the final embodiment of the hardware is highly faithful to the original vision.

"Such partnerships have other benefits too," says Court. "For example, seat manufacturers can remove variability and unknowns from their programmes by using proven solutions. Additionally there are integration opportunities to be explored. By positioning itself as a partner, not just a supplier, aesthetic and functional blending opportunities are created by Bucher Aerospace and its partners that could not have been realised with a traditional business approach."

So, on the foundations of past success, with a clear vision of the importance of providing the key interface between passenger accommodation and IFE systems, and the plan to be the best possible value-added partner in the future, Bucher Aerospace looks forward with great excitement to delivering innovative solutions for years to come. ☒

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onestopshop

SIAEC, in cooperation with its partners SJAMCO and JADE, offers turnkey interior modifications

Gone are the days when air transport was purely about moving customers from point to point. Today the passenger experience is hugely important, and operators dedicate a lot of time to seats, lighting and IFE. SIA Engineering Company (SIAEC), with more than three decades of MRO experience, understands this change in philosophy and is committed to helping airlines achieve their dream cabins.

SIAEC has upgraded and retrofitted cabins on aircraft such as the B747, B777 and A345. With its joint ventures and OEM partners Singapore JAMCO (SJAMCO) and JAMCO Aero Design and Engineering (JADE), SIAEC is one of the first in the Asia Pacific region to provide turnkey interior modification solutions to airlines, from initial cabin conceptual design right through to certification and installation.

Besides the general cabin repair, refurbishment and restoration, SIAEC also has the capabilities to provide services such as aircraft cabin interior design and engineering, manufacturing and fabricating of parts, as well as obtaining regulatory design approvals such as the STCs.

As SIAEC continually strives to add value to its airline customers, it has, in collaboration with TownSend Leather Institute, developed more repair capabilities for leather products and plastic mouldings. As a one-stop integrator, SIAEC aims to provide high-quality and cost-effective aircraft cabin interior services.

SIAEC The company's maintenance facility in Singapore provides MRO services to a large client base of more than 100 international airlines and aerospace equipment manufacturers. As an integrated MRO solutions provider, SIAEC offers a complete suite of services, including line maintenance,


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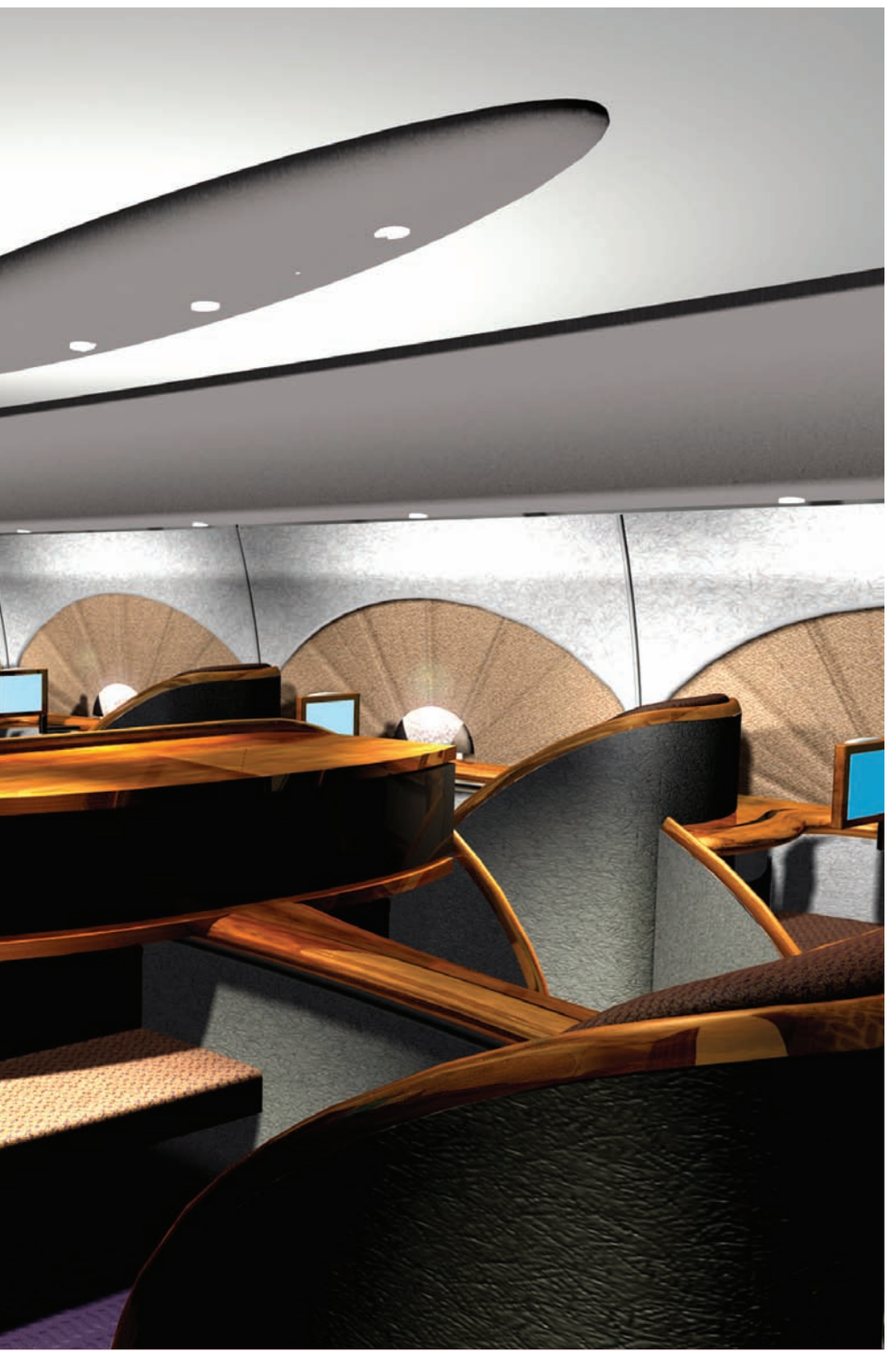
> SIAEC IS ONE OF THE FIRST IN THE ASIA PACIFIC REGION TO PROVIDE TURNKEY INTERIOR MODIFICATION SOLUTIONS TO AIRLINES



01. A conceptual design for a first-class cabin

airframe maintenance, component overhaul, engine overhaul, freighter conversions, cabin modifications and fleet and asset management.

SIAEC serves a large client base of international airlines flying Boeing and Airbus aircraft such as B737NG, B747, B777, A300-600, A310, A319/A320/A321, A330, A340 and A380 types.

The company has approvals from more than 50 airlines and national aviation regulatory authorities, including the Civil Aviation Authorities of Singapore (CAAS), the Federal Aviation Administration (FAA) and the European Aviation Safety Authority (EASA), enabling it to provide MRO services for aircraft registered in Singapore, the USA and Europe, among other regions.

Over the years, SIAEC has pursued a strategy of forging strategic partnerships with world-leading aerospace OEMs. Today, its stable of 24 joint ventures and subsidiaries are located in nine countries – Singapore, Australia, Hong Kong, Indonesia, Ireland, Taiwan, the Philippines, the USA and Vietnam. SIAEC says the joint ventures not only increase the breadth of its service offerings, but also raise the standard of its MRO services, and reduce turnaround times.

SJAMCO SJAMCO is a joint venture formed between SIAEC, JAMCO Corporation and Itochu Singapore, established in January 1988.

The company specialises in the design, manufacture, maintenance and repair of aircraft interior furnishings and equipment. Products designed and manufactured by the company include galley complexes, closets, stowages and cabin partitions. In collaboration with its business partners, SJAMCO also supplies replacement seat cushions, bed padding and other aviation foam products to major airline customers.

Image: Singapore Airlines

02. One of SIAEC's projects, a business-class cabin for Singapore Airlines
03. SIAEC provides aircraft cabin design and engineering services

> JADE OFFERS COMPLETE PROGRAMME INTEGRATION FROM START TO FINISH

SJAMCO is an Airbus and Boeing approved supplier for galleys and monuments for single-aisle commercial jets such as the A320 series and B737 series. As a comprehensive service provider, SJAMCO's maintenance services include the repair and overhaul of cabin monuments (galleys, lavatories, overhead bins), seat upholstery refurbishment works, aircraft unit load device repairs and insulation blanket repairs for commercial and business aircraft. The company also provides in-situ cabin maintenance programmes and line maintenance services such as ground support services, aircraft arrival/departure/towing services, vacuum toilet line jetting services and carpet cleaning services at Singapore Changi International Airport.

SJAMCO holds many certifications from national aviation regulatory authorities, including CAAS Part 145, Part 21 POA, Part 21 DOA; EASA Part 145, Part 21 POA, FAA Part 145 and MDCA manufacturing approval.

SJAMCO also boasts a static load test fixture that can perform static load tests on galleys and monuments, and is one of the first in the region, besides Japan, to have such a full capability. The company has also set up a flammability laboratory, designed to meet FAR Part 25.853 requirements.

With these capabilities, SJAMCO proposes a comprehensive one-stop shop for cabin monument solutions as well as OEM-level repair.

JADE JADE is a joint venture formed between JAMCO America and SIAEC, established in July 2004. The company specialises in turnkey solutions for aircraft interior modification and cabin refurbishment. It also provides customised integrated programme management and consultancy services to airlines. Its full suite of services enables airlines to purchase a completely installed and certified product from a single source.

JADE offers complete programme integration from start to finish, through integration with other suppliers managing IFE systems, PC power systems, seats, galleys, lavatories and other monuments on both Airbus and Boeing aircraft.

JADE provides structural, electrical, and systems engineering design for complete aircraft modification, as well as on-site engineering liaison and certification support.

Together with JAMCO America, JADE supplies aircraft modification kits, materials, customised closets, dividers, overhead bins, crew rests, monuments and furniture.

JADE has the capabilities to certify aircraft interior modifications with STCs under the airworthiness regulations of CAAS, the FAA and EASA. In April 2007, JADE obtained CAAS' Design Organization Approval (DOA). As an aircraft interior integrator approved to operate under CAAS DOA, JADE can extend new services to its customers to apply for CAAS STC.

In addition, in July 2008 JAMCO America announced it had gained the FAA's approval for Organization Delegation Authorization (ODA). The ODA authorises JAMCO America to determine compliance and perform certification functions on behalf of the FAA, including the issuance of STC, approval of technical data and determination of compliance to the airworthiness standards, performance of inspections and issuance of airworthiness approvals. JAMCO America has obtained and managed more than 70 STCs for numerous different modifications on more than 2,000 aircraft. ☒

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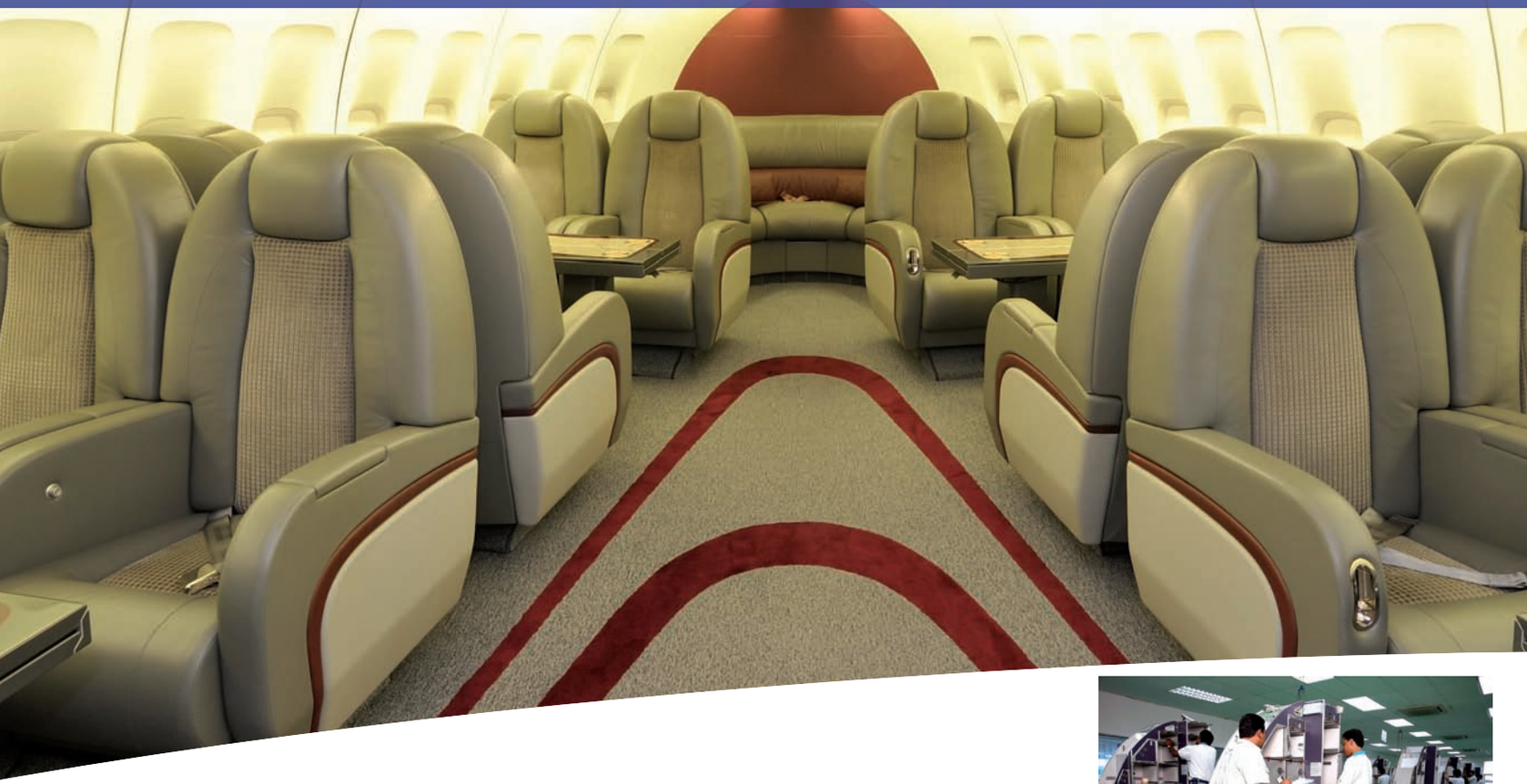
Integrating Experiences and Capabilities to Achieve Your Customers' Dream Cabin



JADE JAMCO AERO DESIGN & ENGINEERING

SINGAPORE JAMCO PRIVATE LIMITED

SIA ENGINEERING COMPANY

We, at SIA Engineering Company (SIAEC), along with our joint ventures, Singapore JAMCO (SJAMCO) and JAMCO Aero Design and Engineering (JADE), understand the importance of building distinctive experiences on the aircraft cabins for airlines to meet the high expectations of its customers.

Our ability to provide a fully integrated solution covering the design, engineering, certification, manufacturing and installation of new cabin product stems from our decades of successful aircraft interior experiences for airlines.

Together, we are able to offer seamless solutions from design and configuration of interiors including the installation or retrofit to new IFE/Seats/Galleys/Toilets/Monuments as well as interior lighting systems as positive consumer experiences begin right from the touch, sound and smell of the aircraft interior to the colours and textures used.

As a one-stop centre for turnkey aircraft interior modifications, SIAEC and our joint ventures will amalgamate our combined experiences and capabilities, to help your airline achieve your customers' dream cabin.

SIA Engineering Company, Marketing & Sales Email: siaec_marketing@singaporeair.com.sg Website: www.siaec.com.sg Tel: (65) 6541 5390

SIA ENGINEERING COMPANY

INTEGRATED MRO SOLUTIONS

finedining

A range of galley products designed to shake up the commercial and business jet market – including an induction cooking station for restaurant-style cooking

01. A galley decked out in MGS products, and finished with one of its Mercury Awards
02. The new microwave

Modular Galley Systems (MGS) has developed a range of galley inserts designed to bring a new dimension to inflight catering, and open up a whole world of culinary potential. The range includes Multifunctional Heating Units, a microwave, a cooking station and accessories for various cooking methods. These are all designed to enable a variety of inflight service, even open cooking, to satisfy increasing demands from business jet clientele.

Since its launch, the Multifunctional Heating Unit series has won three Mercury Awards. The unit combines both induction heat and steam heating – induction to speed up the cooking process; and steam to conserve vitamins, retain appetising colours, and prevent ingredients from drying out. A variety of inserts enable the operator to broil fish and meat, fry eggs, toast bread, steam vegetables and cook pasta and rice. The smart programming system with automatic processing, coupled with its innovative heating technology and special attention to materials are all designed to ensure simple, convenient and safe handling for the operator.

To increase market penetration, MGS has also developed an ARINC version

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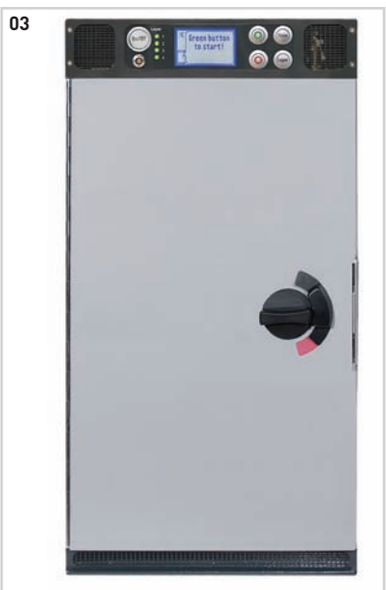
> A VARIETY OF INSERTS ENABLE THE OPERATOR TO BROIL FISH AND MEAT, FRY EGGS, TOAST BREAD, STEAM VEGETABLES AND COOK PASTA AND RICE



03

04

of the Multifunctional Heating Unit. This unit provides the same features of the original series, but in compact version, meeting all requirements of ARINC 810 and 812 standards.

As a complement to its induction series, MGS introduced a brand new microwave at the NBAA Annual Meeting and Convention in October 2010. The compact microwave was created to heat meals rapidly on board. There are predefined heating programmes such as 'Popcorn', 'Defrosting' and 'Baby Bottle Heating' for ease of use and further programmes can be added to fit specific customer needs.

FREE COOKING Another of MGS's products, designed specifically to provide exclusive restaurant-quality service on VIP aircraft, is the inductive Cooking Station. This product includes a Ceran cooking surface with two standard hot plates and one extra-large wok plate. The product is designed to open new possibilities, enabling free cooking as in restaurants.

The company says the Cooking Station is based on certified technologies, and to ensure safe use on board, was developed with simple removable and cleanable fixtures to secure pans. All visible surfaces are made of stainless steel, with the joint aims of making the product visually appealing, robust and easy to clean. For maximum comfort and safety (and to avoid smells spreading through the cabin), MGS recommends installing a Fume Hood alongside the Cooking Station. The Fume Hood is equipped with integrated LED spotlights and a smoke detector that switches off the Cooking Station automatically when an unusual amount of fumes is detected.

Besides its oven and accessories, MGS specialises in software development tools for RFID and ARINC solutions. The company is a wholly owned subsidiary of Iacobucci HF, a leading manufacturer and supplier of electrical galley inserts worldwide. With 30 years of experience, a flair for innovation and a customer oriented approach, Iacobucci HF excels in the engineering, design and manufacture of espresso and coffee makers, water heaters, trash compactors and trolleys for commercial and business aviation. ☒

03. MGS's Multifunctional Heating Unit

04. The Cooking Station

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going green

A range of fabrics designed with weight, waste and durability in mind reflects Tapis's focus on environmentally sound solutions

01. Ultrasuede, a faux suede made from 100% recycled fibres

For more than 30 years, Tapis has offered fabric products that are designed with environmental concerns and long-term performance in mind. The company says the performance attributes of its products ensure a sustainable presence within the aircraft interior.

As part of its commitment to provide high-quality products to the aircraft interiors industry that are safe for the environment, Tapis utilises manufacturing processes that are based on the conservation of raw materials, toxic-free solutions and minimal dependency on natural resources.

"We provide a product that is a reliable investment, guaranteeing longevity, and decreased waste and costs for replacement," says Jason Estes, sales manager at the company. "Our quality ensures a lifespan that will exceed expectations for the function and performance of most applications."

ULTRALEATHER Tapis's Ultraleather range is part of a new generation of polyurethane-based products made using a process designed to minimise waste, reduce emissions and consume less energy. Ultraleather is made of polycarbonate, a polyurethane resin that Tapis says boasts high resistance to heat and light, and great durability. "Additionally, as a result of its substantially lighter weight, Ultraleather reduces fuel consumption, driving costs down and reducing the carbon footprint," says Estes. The product also offers 100% yield, which means no waste. "The aesthetics and durability of Ultraleather products make them a brilliant leather alternative with superior quality," says Estes.

Tapis has also partnered with The Leather Institute to provide customers with the resources to clean and repair Ultraleather, and thus extend its lifespan even further. Through this

> WE PROVIDE A PRODUCT THAT IS A RELIABLE INVESTMENT, GUARANTEEING LONGEVITY, AND DECREASED WASTE AND COSTS FOR REPLACEMENT

02

about Tapis

The magnitude of the innovations and technological advances that Tapis has made over the last 30 years might be expected to have come from much larger corporations. Founded in 1977 by Al Caputo, Tapis has pioneered special processes to align its fabrics with stringent aeronautic specifications. Tapis has led the way in applying new creative techniques to fabrics, including embroidery, appliqué and screen prints. In fact, Tapis was one of the first companies to provide qualified soft furnishing for OSU vertical application to the commercial aviation market in 1986 (now used by over 50 commercial carriers). Under the leadership of Karen Caputo, president, Tapis continues to respond to the evolving needs of this specialised design market.

Headquartered in Armonk, New York, USA, Tapis also has a facility in Dallas, Texas, and a distribution network that spans the globe. Tapis Corporation is a qualified vendor for Boeing Aircraft Company, Bombardier, Cessna Aircraft, Dassault Falcon Jet, Gulfstream Aerospace, Lear Jet, Hawker Beechcraft, Duncan Aviation, Midcoast Aviation, Jet Aviation and completion centres and commercial airlines worldwide. In October 2008, Tapis Corporation's operations were certified to the ISO 9001:2000 International Quality System Standard.

partnership with The Leather Institute, an expert at repairing leather and Ultraleather, Tapis now offers a biodegradable cleaner for the general maintenance of Ultraleather. The Leather Institute also offers restoration services, including cleaning products, conditioning, touch-ups, colour restoration, repair and training.

TAPISUEDE Another of Tapis's products is TapiSuede, which is comprised of 88% polyester (100% of which is high-purity recycled polyester) and 12% polyurethane. Tapis uses high-tech manufacturing techniques and water-dispersed polyurethane to eliminate the need for organic solvents. The polyester fibres are made from a mixture of post-industrial and post-consumer recycled polyester. TapiSuede has a non-animal composition and is resistant to stains.

Another variant, TapiSuede BHC-SS, maintains the same characteristics as the standard TapiSuede, but is designed to be extremely lightweight and meet the most stringent flame-retardant requirements for commercial aircraft. "The durability, flexibility and ability to function on many panels with various adhesives makes TapiSuede BHC-SS an excellent choice for aircraft interiors," says Estes.

Meanwhile Ultrasuede is made of 100% recycled ultra-microfibres using a manufacturing process that the company says is ecologically sound and reduces energy consumption. "Ultrasuede is inherently stain resistant, which means no harmful chemical treatments are required for cleaning," says Estes. "This faux suede is a luxurious, cruelty-free, environmentally safe alternative fabric to genuine suede that is suitable for many interior aircraft applications."

The company also offers natural fabrics with no synthetic fibres – Grospoint and Geneve. These are made from 100% naturally grown, raw (undyed) cotton and wool. None of the substances used in dyeing and finishing these fabrics appear on the European Chemicals Agency's substance of very high concern (SVHC) list. ☒

02. Ultraleather is designed to be light weight, and offers 100% yield

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allrounders

Specifiers no longer have to sacrifice physical properties and aesthetics when choosing sheet for aircraft interiors

01. Boltaron offers thermoplastic sheet in a wide selection of colours, textures and patterns

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; FAR 25.853 (d); FAR 25.853 A1(i); and FAR 25.853 A1. In addition, many aircraft interior applications also require compliance with Airbus ABD-0031 and Boeing D6-51377 toxicity standards, which were enacted to limit toxic gas emissions when burned.


01

"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 instead focus on differences in functional attributes, aesthetic qualities, and supplier policies to pinpoint the high-performance sheet product that best satisfies your individual requirement," says Adam Mellen, director at Boltaron Performance Products. "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."

PROPERTY-TO-COST RATIOS Mellen's first tip is to aim for a product that offers the greatest physical property values – especially impact resistance – at the same cost as lower performing sheets, or better still, offers the best physical properties as well as the lowest cost. Specifiers can evaluate aircraft-rated sheet products from major manufacturers in terms of Izod impact resistance, specific gravity, tensile strength, flexural modulus, Rockwell hardness, heat deflection, heat release, NBS smoke and thermal expansion by comparing specifications of individual grades online.

"Less obvious, but as important in many cases, are other product characteristics that effect performance in the field," says Mellen. "For example, some sheet products simulate a metallic appearance by reverse printing of metallic ink on clear cap film that is laminated onto a thermoplastic substrate, whereas other metallic sheet is comprised of a cap film with integral metallic colouration, offering greater scratch resistance. You should acquaint yourself with such differences before purchasing any sheet product."

Sheet quality is also critically important. "If you are not yet experienced in aircraft interior sheet sales, you should confirm that the brand of sheet you are considering is known to be free of pits and inclusions – problems you can research through other specifiers, or through sheet suppliers themselves," says Mellen.

AESTHETIC OPTIONS Specifiers should also check the manufacturer can offer the aesthetic options they need. "Designers yearn for the widest possible selection of colours, metallics, woodgrains, patterns and textures – the tools they need to create interior environments that owners and passengers will prefer over the interiors of competing aircraft," says Mellen. "You should therefore attempt to maximise the aesthetic options offered by the sheet manufacturer you are considering."

These options could include unlimited solid colours, translucent colours, clear sheet, woodgrain prints, custom patterns, thicknesses ranging from 0.003-3in (0.076-76.2mm), unlimited surface textures, scratch-resistant surfaces, integral metallic colours, and varying levels of gloss.

"Because aircraft interior projects generally start small and then grow, the sheet supplier you select should also offer very low minimums on all variants of its sheet products, enabling you to initiate a project without cost penalties or long deliveries," says Mellen. ☒

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- Outperforms flame retardant ABS and polycarbonate
- Matching calendered, extruded and press laminated grades in gauges from .003 to 3.0 in. (.076 to 76.2 mm)
- Unlimited solid colors, metallics, pearlescents, translucents and clears, and unlimited patterns including carbon fiber, woodgrain and abstracts
- 10 Standard surface textures, and custom textures with low minimums

BOLTARON

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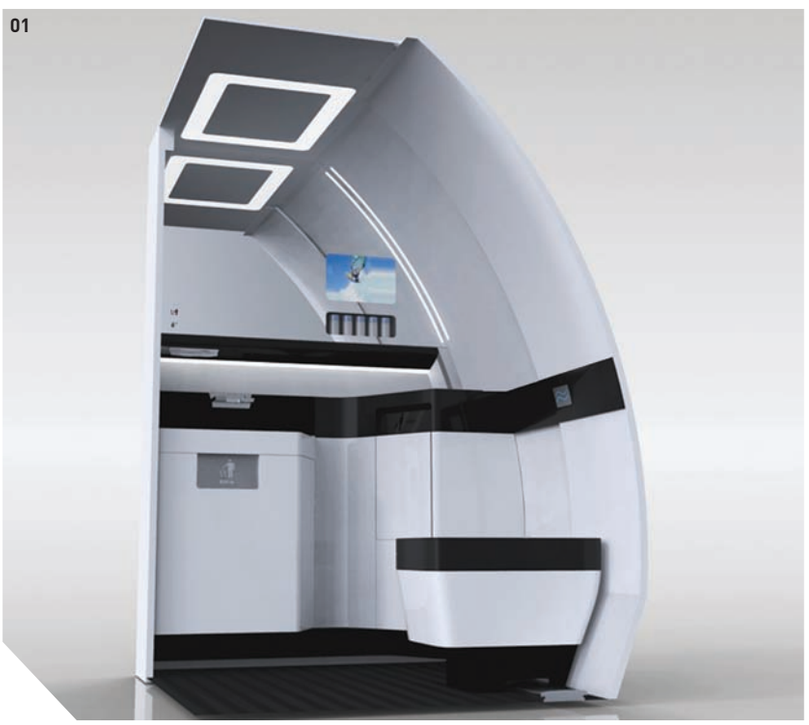
sealingthedeal

Diehl Aerosystems says the acquisition of Dasell strengthens the group's status as a first-tier supplier

01. The HILA by Dasell, which won a 2010 Crystal Cabin Award
02. Diehl Aerosystems offers packages combining products from its various units, for example, lining and lighting

Following its purchase in 2008 of the former Airbus site in Laupheim, Germany – now called Diehl Aircabin – Diehl expanded its Aerosystems division again in June 2010, with the acquisition of Hamburg-based lavatory manufacturer Dasell. Until that point 100% owned by Airbus and formerly a joint venture between the aircraft manufacturer and PAIG (originally Sell back in 1991), Dasell is now a sister company to Diehl Aircabin and Diehl Aerospace.

This not only added another 600 employees to Diehl Aerosystems, but expanded the group's product line. In addition to cabin lighting and cabin systems electronics by Diehl Aerospace, and air ducting, lining, monuments, crew rest compartments and hat racks by Diehl Aircabin, Diehl Aerosystems can now offer lavatories, showers and washrooms to its customers, as a package or in individual selections. On top of the cabin business, Diehl Aerospace is also a leading supplier for various avionics products.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THE ACQUISITION The addition of Dasell and its products consolidates Diehl Aerosystems' market position as a first-tier supplier. However, successful integration is not a given, therefore the company has decided to fine-tune its strategy after passing this important milestone. In the immediate future, Diehl Aerosystems boss Rainer von Borstel, who took over from Rainer Ott in the summer of 2010, will first focus on operational excellence, then on the integration of the three units, and – thinking beyond imminent action – on further growth.


02

"Delivering on time, on quality and within budget is the key to customer satisfaction and the foundation of our success in the future. Therefore, for the time being we need to focus on these priorities after the rapid expansion of the last two years," says von Borstel. Ott added: "We have successfully built up Diehl Aerosystems from the nucleus of Diehl Aerospace since 2008, and this summer I could hand over to Rainer von Borstel a comprehensive division that is perfectly positioned to consolidate its status as a preferred partner for cabin integration."

In its new shape, Diehl Aerosystems is in the favourable position of having avionics, interiors, cabin electronic systems and integration competencies in its portfolio. While galleys are not yet part of this, the company says it does have the in-house capabilities for that type of product, so can offer solutions in this field if required, and if it makes business sense.

CRYSTAL CABIN AWARD Dasell was a guest on Diehl Aerosystems' stand at Aircraft Interiors Expo in Hamburg, Germany, in May 2010, when the lavatory manufacturer won a Crystal Cabin Award in the passenger comfort category for its High Integrated Flexible Lavatory (HILA).

HILA is designed to optimise space for lavatories on board. At cruise altitude the cabin crew can expand the

> SUCCESSFUL INTEGRATION IS NOT A GIVEN, THEREFORE THE COMPANY HAS DECIDED TO FINE-TUNE ITS STRATEGY AFTER PASSING THIS IMPORTANT MILESTONE

lavatory into the area near the doors, which is not used during flight.

Diehl Aerosystems says these events and developments coincided with more good news from OEMs – aircraft production is scheduled to ramp up again, and programmes with Diehl involvement passed important milestones. Both the Boeing 787 – for which Diehl Aerospace is contributing the cabin lighting system in all-LED technology – and the A400M military transporter – for which the company is supplying (amongst other elements) the Doors Control and Monitoring System – saw their long-awaited first flight. In addition, Dasell is supplying lavatory units for the A400M programme.

Diehl Aerosystems is looking towards 2011 both with confidence in its market activities, and with many tasks at hand. In addition to the annual Aircraft Interiors Expo in Hamburg in April, the company has a number of other expo events on its agenda, including Aero India in Bangalore, India, in February; EBACE in Geneva, Switzerland, in May; Le Bourget, France, in June; and the Dubai Air Show in November. At these trade events, Diehl Aerosystems will display the evolution of its products.

"Operational excellence will be on top of our priority list, but at the same time we must not neglect strategic projects," says von Borstel, summing up the company's prospects for the coming year. "While serial and development programmes keep us busy, we must make sure that we keep our company and its products in fit shape for the long-term future. Therefore, we will keep working on the evolution of our portfolio, and at the same time we address established and emerging markets all over the world." ☒

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tightenyourbelt

A new passenger lap belt, Schroth AirLite, is designed to yield weight and kerosene savings, ultimately saving money for airlines

Under the leadership of BAE Systems Security & Survivability Systems, the Schroth brand provides state-of-the-art restraint systems. Its products range from passenger lap belts to VIP restraints, crew restraints and belt-integrated airbag systems.

BAE Systems Security & Survivability supplies Schroth flight attendant restraints for the entire Airbus fleet, as well as pilot and passenger restraints for numerous aircraft manufacturers worldwide. The product range also includes aviation seating products. Schroth restraint systems can be found as original equipment on the aircraft of many international airlines.

During the 2010 Aircraft Interior Expo in Hamburg, Germany, Schroth launched its new Schroth AirLite passenger lap belt. The new lap belt is designed to be ultra-lightweight, and therefore dramatically reduce the total cost of ownership, through weight and kerosene savings. The company says Schroth AirLite has opening angles of 30° or 90°, is available in a large variety of webbing colours, and is certified according to ETSO/TSO-C22g.

01


02

> WITH 150 RESTRAINTS PER SINGLE-AISLE AIRCRAFT SCHROTH ESTIMATES WEIGHT SAVINGS OF AROUND 6KG PER FLIGHT

The company says a significant part of a customer's initial investment in Schroth AirLite would be amortised over a short period of time. At less than 240g (0.53 lb), Schroth says that Schroth AirLite is approximately 40g lighter than a standard passenger lap belt. With 150 restraints per single-aisle aircraft Schroth estimates weight savings of around 6kg per flight, and kerosene savings of around €450 per year.

The company says its customer service covers all important service areas expected by professional airline customers, including fast AOG service, short turnaround times for repairs, customised solutions for special applications, and a wide range of webbing colours to match any interior design concept. ☒

01. BAE Systems' Schroth factory in Arnsberg, Germany
02. The Schroth AirLite passenger lap belt

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flybywire

A2c Air Cost Control is helping OEMs and their suppliers to concentrate on business by providing a source for electrical wiring products

Standing out is exactly what company A2c Air Cost Control has been doing since its inception in the year 2000. But what does the company offer that makes it different? "The tendency in aerospace distribution is to add new product lines as quickly as possible. We're going against the grain by keeping our focus on developing our core strength – electrical wiring products for aircraft," says Laure Parelle, sales director at A2c Air Cost Control.

Demand for interconnect products comes from manufacturers of cabin interiors, seating, interior lighting and IFE systems including installation kits. Each OEM has its own individual requirements, but all of them require parts quickly from time to time, to satisfy their customers.

A2c Air Cost Control has built its reputation in Europe as a premier source for electrical hardware for new and existing subcontractors working on the A380 and A350. These new programmes utilise the most recent developments in electrical wiring and connector technology. A2c Air Cost Control says that few companies can offer support if they do not know how to source this material. "Purchasing office services are especially useful for new subcontractors, who don't have the buying volume necessary to work with the manufacturers directly," says Parelle. "Prototypes require very small quantities."

A2c Air Cost Control says that its role is critical to helping OEMs do business with new companies. For example, in 2008, A2c Air Cost Control played a pivotal role in helping Duncan Aviation meet its deadlines for the start-up of its Falcon 7X completions programme. "Duncan needed to find a way to procure electrical parts called out on drawings from European engineers at Dassault," says Parelle. "The material was new to them and couldn't be sourced through their existing supplier base."

Having received an Airbus Excellence Award in 2007 and a second nomination in 2010, A2c Air Cost Control is winning recognition with its dual formula as a stocking

01. Air Cost Control stocks a vast collection of electrical wiring products

01

> LARGE OEMS CAN OUTSOURCE THEIR PURCHASING ACTIVITIES AND USE THEIR RESOURCES IN BETTER WAYS, LIKE ASSEMBLING AIRCRAFT

distributor and purchasing office. It says the need for its spare parts and supply chain services is increasing. "In an industry where maintaining an extensive supplier base is costly, large OEMs can outsource their purchasing activities and use their resources in better ways, like assembling aircraft," says Parelle. "Not to mention the cost of carrying inventory, which can be a burden to companies who implement lean manufacturing."

A2c Air Cost Control also makes sure its sales team is up to the task – staff members undergo extensive technical training by Airbus engineers. The sales people are trained to be able to recommend tooling, and offer installation information and product support. Customers have one point of contact for sales and support.

With all of the acquisitions that have taken place within aerospace distribution in the last two years, A2c Air Cost Control is confident that its lean structure and specialist nature will help attract new customers. "You have to be lean and flexible to be able to offer a high level of service when helping customers deal with today's difficult deadlines," says Laurent Parelle, CEO of the company. "Our way of adding value to the supply chain is by understanding the product, understanding its availability, and finding a solution to our customers' needs.

A2c Air Cost Control has two stocking locations – in Toulouse, France; and Miami, Florida, USA. It benefits from a worldwide sales network with offices in Paris, Madrid, Zurich, Dubai and Beijing. The company handles material for nearly every electrical manufacturer on European programmes, including Airbus, Dassault Falcon Jet and Eurocopter. ☒

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joiningforces

Lighting expert Schott partners with design company ludekedesign to offer products marrying design and simplicity

To gain an edge over the competition, airlines are increasingly focusing on the ambience of their passenger cabins. Schott believes that technology and design have to speak the same language for innovative solutions to work, requiring a combination of knowledgeable engineers and creative designers. This is why the lighting expert partners with design firm ludekedesign.

"You're ahead of the game if you can combine attractive design with high tech," says Armin Plichta, general manager of transportation at Schott Lighting and Imaging. "That's why our design-oriented team works closely with our partners in finding innovative ways of turning creative design ideas into reality."

The Swiss designer who heads up ludekedesign, Christine Lüdeke, is always faced by the same challenge whenever she works on new designs. "I try to link my dreams to reality, i.e. I let my fantasy as a designer run free when I develop new ideas, but I have to look at the same time for practical ways of realising these ideas," she says. In Schott – a creative, design-oriented engineering company – she has found the perfect partner to turn her dreams into reality.

The aircraft environment poses many challenges for designers – such as extreme security, tight seating space and little flexibility regarding weight. These factors can limit the selections of materials, shapes and technologies from the outset. "I know there is not much leeway but that is the challenge I love," says Lüdeke. "There are many more possibilities than you might expect at first glance for developing creative ideas. But this only works if both partners are equally open to new ideas and explain their respective requirements to each other. And this is just what I find at Schott."

01. A cabin lighting concept, complete with compact in-seat reading lights

SCHOTT DISCUS Schott and ludeke design have worked together since 1996 on reading lights for the business-class cabins of Singapore Airlines and Finnair, as well as on design studies. One of the first projects that Schott and ludekedesign worked on together was the development of the Schott Discus reading light. This was designed to be a small and compact light, optimised for integration into the seat headrests or anywhere else where a good-looking spotlight might be needed on board.

The disc-shaped reading light is fully incorporated into the seat and folds out smoothly when tapped, using LED technology to light the exact area that the passenger wants.

"Today's 'Ikea generation' put a lot of value on design," says Lüdeke. "That's why we selected a round, optically attractive shape with top-quality materials and surface."

Both project partners were quick to agree on the positioning of the reading light in the seatback. "When it comes to placing reading lights, the seats in economy do not give as much choice as the more spacious ones in business class. Light shining from the front gives passengers the best chance to direct it where they want it," says Lüdeke.

The challenge of constructing the lighting system was huge, as the depth available for integrating the lights is minimal. This is where Schott's LED lighting system came into play – the company designed it to take up little room and to be easy to integrate.

> THERE ARE MANY MORE POSSIBILITIES THAN YOU MIGHT EXPECT AT FIRST GLANCE FOR DEVELOPING CREATIVE IDEAS

The solution was not designed for a specific client. “Our thinking is focused on the user and so we also develop solutions proactively,” says Plichta. “This is why people appreciate Schott as a partner in creating solutions. Schott is a technological company but sees itself as a partner to customers and a professional for unique lighting solutions. Airlines and designers hold the company in esteem because it comes up with proposals for equipping cabins or creating special lighting effects. Working together with design agencies is a big help as there are hardly any airlines with their own designers.”

Both partners are open to the trends of the future. “I love the challenge of communication areas in aircraft – such as opening up the galley to passengers like on TV cooking shows,” says Lüdeke. Plichta believes that looking ahead goes beyond aviation: “Things that have become established in aircraft are now finding favour in all fields of transport, whether in cars, buses, trains or yachts. So we are directing our know-how at these sectors, too.” ☒

02. The Discus reading light

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LASTWORD

fitforpurpose

Usability, durability and aircraft seating – how to improve the passenger experience through rigorous testing

Andy Baker, Davis Associates

Headrests that won't stay in position, tables that jam, IFE handset cables that won't retract, IFE screens that fail to adjust, broken cup-holders and damaged trim panels. These and other seat durability problems cost time and money to fix and have a negative effect on the passenger experience.

The established engineering method for assessing durability uses lifecycle simulation rigs. However, this excludes one of the main factors that can cause durability problems, namely variations in passenger behaviour. Davis Associates' usability insights research has revealed the behaviour patterns that can lead to passengers inadvertently damaging the seat mechanisms. This damage can occur either through a single incident or by repetition over time, for example:

- Applying too much force;
- Applying it in the wrong direction;
- Trying to move something that is not designed to move;
- Forcing something beyond its range of travel;
- Operating in the wrong sequence – for example without releasing a catch first;
- Forcing or storing items where they are not designed to be;
- Pulling, leaning, sitting or standing on something not designed to take the load.

This behaviour is sometimes described as 'misuse', as it does not align with the design intent and thus lays the blame with the passenger. However, from the passengers' perspective their behaviour seems perfectly rational, as no alternatives are apparent in their eyes. If you can discover why passengers operate your seat in a certain way, you can either change the design to modify this behaviour or strengthen the seat to cope with it. In this way, you can reduce the occurrence of damaged or unserviceable seats, reduce maintenance costs and improve the passengers' experience.

For maximum efficiency and cost effectiveness, it is important to resolve these issues at the design stage, and not in production. You will not be able to predict passenger behaviour from behind your desk, or even by observation of passengers in service. The ideal route is to carry out usability testing of each feature to understand your passengers' mental model of its operation, and hence whether your design fits that model.

You can learn a great deal from an iterative testing process. Don't wait for a complete prototype seat, which may arrive too late in the programme to allow changes to the design. Instead, all elements can be user tested using mock-ups and standalone test rigs. Recommendations for a successful programme of usability testing include:

- Define clear pass/fail criteria to ascertain whether your design has succeeded;
- Engage with end users early in the design process;
- Keep sample sizes small and focused – you will learn about the key usability issues within the first 20 to 30 participants;
- Include crew and maintenance staff in the testing process – they will have first-hand experience of passenger behaviour;
- Show the design team – use video and interviews to illustrate the findings.

At the end of this process, you will gain a clear set of passenger-centric requirements to aid making your seats usable and reliable. ☒

about the author

Andy Baker is an ergonomist with over 20 years' experience in seat design and usability for transport applications. He is a director of Davis Associates Ltd and a Fellow of the Institute of Ergonomics and Human Factors. Contact Andy at andy@davis-associates.co.uk or see www.davis-associates.co.uk for more info.

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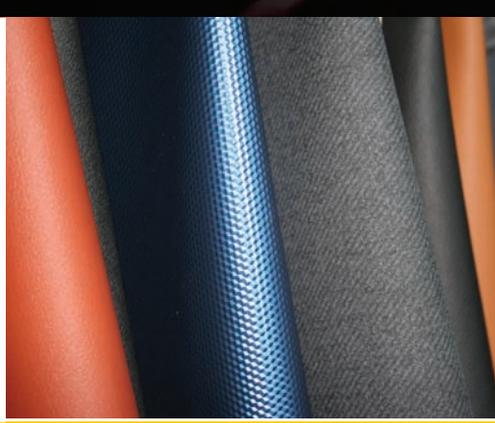

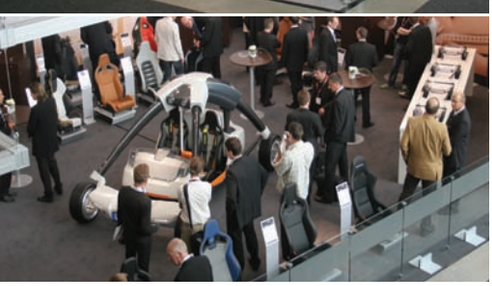

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