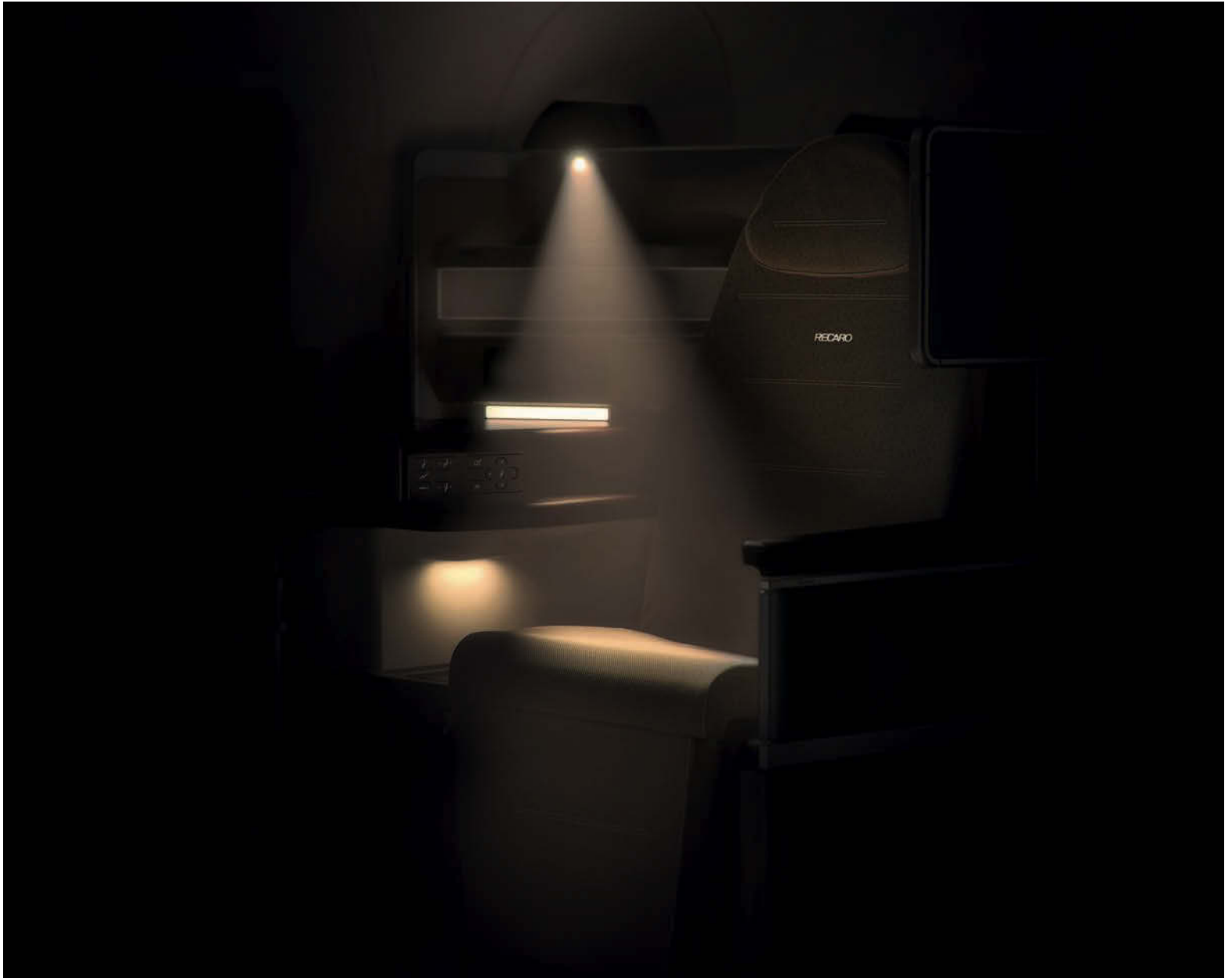




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044

“Ultimately, the airport is a big funnel, collecting from far and wide, and delivering through a small spout into a container”



058

112

## bigwelcome

Welcome to the biggest-ever issue of Aircraft Interiors International. The weight of this issue reflects the thriving aircraft interiors industry, soaring aircraft orders and – we like to think – the quality of the magazine.

In this edition we cover major issues including the shortening lifecycles of aircraft interiors, the incredibly complex and emotive problem of boarding procedures, cabin safety post-Asiana 214, the complexities of gate-to-gate PED use, lounge design trends, and Airbus's new Bag2Go concept, which could eliminate overhead stowage, creating new possibilities for cabin design.

We have also introduced more interviews – Alice Liu, American's managing director of onboard product and connectivity, and Lufthansa's Dr Joachim Scheider, vice president of product management in this issue – as well as new regular pages featuring the thoughts of industry suppliers.

We are also debuting a regular feature on the final page, which takes a fond look at classic cabin designs. We start off in 1997, with the final incarnation of the British Airways Concorde interior, often unfairly attributed to Sir Terence Conran, though he did work on some of the soft elements. Seventeen years on from the creation of that cabin, its designers – Factorydesign and Paul Wylde – have worked together again on another milestone product: US domestic LCC JetBlue's new Mint experience, which is also explored in depth in this issue.

Expect to hear a lot more from us shortly, via our website and LinkedIn group, as we prepare for and report from one of the biggest events of the year: Aircraft Interiors Expo. If you're in Hamburg on 8-10 April, be sure to drop by Stand 5E44 to meet the team and share your thoughts.

Adam Gavine, editor

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# regulars

## 013 news

The newest step in Air France's rejuvenation; the latest industry figures; Skymark's all-premium economy A330; Qatar's all-business A319s; a pair of galley concepts from Zodiac; flying testbeds; Royal Brunei's Dreamliner and more...

## 030 supplier interview: Yarwood Leather

Matthew Nicholls, managing director of Yarwood Leather, discusses how to add luxury while saving weight and money

## 032 supplier interview: TSI

Find out how this young seat manufacturer intends to quickly become a big player in the market

## 034 design briefs

Imaginative thinking from around the world, with a vision for a healthier long-haul economy product, an interior inspired by city living, a flying yacht and a business seat that immerses the passenger in the IFE experience

## 231 products and services

The latest product news from our advertisers

## 263 index to advertisers

## 264 classic cabins

Take a look back at the third and final BA Concorde cabin, which matched Mach 1 performance with luxury materials

## boarding 044

We explore some new thinking to help solve the perennial problem of how to get hundreds of people and their bags on board an aircraft with minimal fuss and in minimal time



# features

## 058 product lifecycles

Cabin redesign schedules are no longer a simple function of fashion and durability. Find out why a host of factors can bring forward investments, and how not to fall into the reactionary trap



## 072 Bag2Go

An Airbus concept that started with a clever suitcase and now has far-reaching implications for cabin architecture



## 086 cabin safety

We explore what cabin products helped preserve so many lives in the Asiana 214 crash – and how they can be further improved





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### 098 safety technology

A look at some of the latest cabin safety technologies that can help save lives when the worst happens



### 104 interview: Dr Joachim Schneider

Lufthansa's VP of product management discusses why the industry must never lose sight of the most important factor: the customer



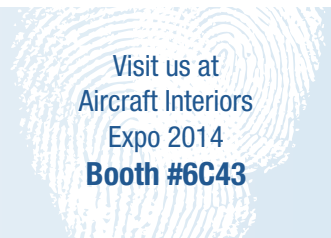
### 112 JetBlue Mint

This single-class American low-cost carrier has introduced a pair of amazing new products: a luxurious business-standard double, and an individual suite



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122 PED use

The FAA's relaxation of the rules on the use of personal electronic devices on board is popular with passengers – but has also raised a range of problems for operators



134 american idol

Marisa Garcia meets American Airlines' managing director of onboard product and connectivity, Alice Liu, who helped drive one of the industry's most ambitious cabin programmes



142 South African Airways

How do you reflect an entire continent of more than 50 countries in one A320 cabin? Priestmangoode and Brand Union answered this challenge for South African Airways



152 lounges

As the executive lounge becomes a key extension of the cabin experience, we look at some of the key trends driving these innovative spaces





165 aircraft interiors expo 2014  
A preview of some of the amazing new aircraft interior innovations that will be unveiled at the Hamburg show this year



211 world travel catering & onboard services expo 2014  
A taste of the fantastic new products and services that will be served up at the show



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# numbercrunch

Some are up and some are down, but the latest industry statistics are positive for the aircraft and airline industries, and for passengers

**54%** of long-haul pax believe greater seat comfort is critical, **41%** will pay more money for more comfort, and **5%** will consider an upgrade to get more comfort  
**Airbus research**

US airlines took more than **US\$1.6bn** in baggage and change fees in Q3 2013 – an increase of **3.8%** over Q3 2012  
**Bureau of Transportation Statistics**

Among **12** carriers surveyed, average calorie count per food item dropped from **388** in 2012 to **360** in 2013  
**DietDetective survey**

The US Department of Transportation received **755** complaints about airline experiences in October 2013 – **23.6%** fewer than in November 2012  
**US DoT Air Travel Consumer Report**

**35.7%** of business travellers will travel more in **2014** than **2013**, while **47.2%** will travel the same amount  
**Frequent Business Traveller survey**

## A call to arms

Nearly 5,000 passengers were asked if aircraft should have phone booths if mobile phone calls are allowed:



Passengers' least favourite airline fees are:

- Baggage fees **48%**
- Flight change or cancellation fees **38%**
- Advance seat selection fees **6%**
- Reservation by phone fees **5%**

**Airfarewatchdog**

## When asked about their slimline seat experiences:

Nearly **50%** of respondents weren't sure if they had sat in one

But of those who had...

- 83%** found them less comfortable than 'traditional' seats
- 8%** found them more comfortable
- 9%** couldn't tell the difference

**TripAdvisor survey**

**+12.5%**

US companies will spend **US\$36.7bn** on international travel this year – **12.5%** more than in 2013 – a big improvement on 2013's rise of **1.8%** and 2012's increase of **0.8%**  
**Global Business Travel Association**

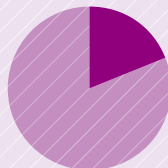
## Of the US public:

**48%** oppose voice calls on mobile phones during flight

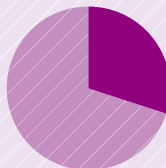


**AP-GfK poll**

**19%** support inflight mobile phone use

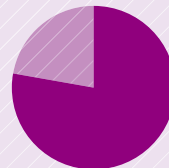


**30%** are neutral

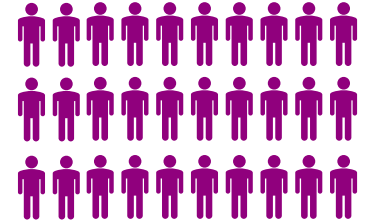


## Of US frequent fliers:

**78%** oppose voice calls on mobile phones during flight



## PASSENGER NUMBERS



2013 saw the airline industry break the **3bn** pax mark for the first time. It will reach **3.6bn** by **2016**  
**Aviation Benefits Beyond Borders report**

**Aviation Benefits Beyond Borders report**

The global commercial aircraft lighting market will grow at a CAGR of **5.36%** from 2014-2018  
**Research and Markets**

**In China from 2013-2018:**

- The commercial aircraft manufacturing market will grow at a CAGR of **3.78%**
- The commercial aircraft parts manufacturing market will grow at a CAGR of **9.37%**
- The MRO market will grow at a CAGR of **7.19%**

**Research and Markets**

# safetyfirst

Some airlines have thousands of hours of IFE on board, but which is the one film everyone watches? The safety video is the most important film shown on board, but that doesn't mean it can't be fun, as these airlines have shown...



1

Expect more new videos to be introduced soon as airlines review their inflight PED use policies



4



2



3



5

1

## Safety dance

Virgin America has created the first safety video set entirely to music and performed in dance. Dubbed the 'VX Safety Dance', the video was directed by Jon M Chu of *Step Up 2* fame, and includes dancers from *American Idol*. Production was handled by Virgin's entertainment arm, Virgin Produced, with guidance from the FAA to ensure all safety requirements were met. It's certainly funky, but can flight safety really be fun? Steve Forte, Virgin America's COO, thinks so: "Too often, the dry, perfunctory safety messaging used in the past was tuned out. We believe we have an obligation to create safety messaging that is not only accurate, but that holds the attention of everyone on board."

2

## Star turn

What better way to grab passengers' attention than to cram your safety video full of celebrities? German holiday carrier Condor did just that, but with a relatively modest budget and without diva tantrums, by using celebrity lookalikes. As the flight attendant performs the demonstration, various doppelgängers fall into line with safety regulations, including Paris Hilton stowing her chihuahua, Michael Schumacher buckling up, Elvis removing his headphones, Charlie Chaplin noting his nearest emergency exit, Marilyn Monroe donning an oxygen mask, the Queen perusing the safety card, and even Neil Armstrong declaring before take-off: "One small step for you, one giant leap for air safety."

3

## Classical education

Film fans will enjoy Virgin Atlantic's latest video, a homage to cinema that takes inspiration from iconic films. The airline brought in design agency Art & Graft to create animated characters – based around a passenger more intent on slumber than safety – that take the viewer on a theatrical journey through different movie genres, including classic Batman, Tintin, James Bond, *Yellow Submarine*, film noir and spaghetti westerns, to capture passengers' attention. It even has movie-style credits at the end, and voice-over by comedienne Morgana Robinson. At 5 minutes 47 seconds in duration, it is comparatively long, but trust us, it is a pleasure to watch.

4

## Don't call me Shirley

If you love the 80s, you'll love Delta's new video, set to an electropop beat. The video – created by Wieden + Kennedy in New York – isn't quite as slick as the Virgin offerings, but 80s fans will enjoy the references which include a LOT of big hair, scrunchies, neon leg warmers, Atari, Rubiks Cubes and body popping. There are even guest stars such as Gerald Casale from Devo, basketball player Kareem Abdul Jabbar (just as famous for his role in *Airplane*), Teddy Ruxpin and Alf the lovable alien. There are so many references to spot that it really holds the attention, and even frequent flyers will be kept interested as the videos are designed to be constantly updated with fresh scenes.

5

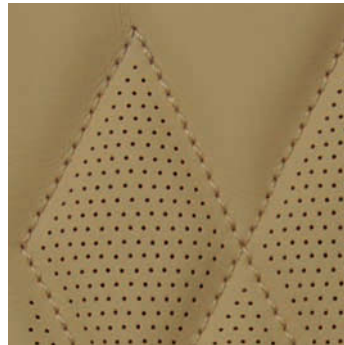
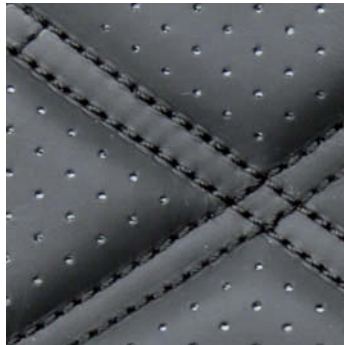
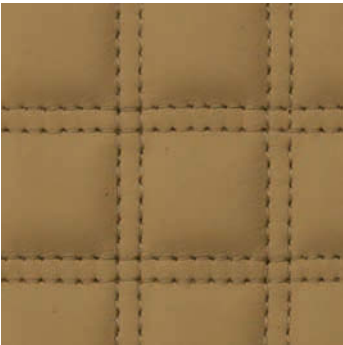
## Beach belles

Air New Zealand has a great history of safety videos, with themes including *The Hobbit* and Bear Grylls. The airline decided to film its latest video in the Cook Islands – one of its destinations – and to add to the glamour, collaborated with *Sports Illustrated's* famous swimsuit models. Titled *Safety in Paradise*, the video features bikini-clad models demonstrating safety procedures on the beach. The video has sparked a lot of headlines – some positive, some less so – and to be honest, it would perhaps be better set in an aircraft rather than on the beach, although that wouldn't really fit with the swimwear theme. It is a safety video, remember – not a destination marketing tool.





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# AERISTOCRAFT

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## Respecting the past

The cabin may look fresh, but it also needs a little national identity.

Thus some distinctly Japanese elements were incorporated into the cabin that both define the spaces and complement the urban café concept. A traditional Japanese katagami pattern was adapted for the partitions. Katagami are handmade paper stencils, which the Japanese have used for centuries for dyeing the textiles used to make kimonos. Over the years, thousands of katagami patterns have been created, but as fewer and fewer Japanese people wear kimonos, the craft is slowly fading away. Thus the application of a katagami pattern in the cabin is also a celebration of a traditional craft. The pattern adapted for Skymark features dots in the shape of tea ceremony utensils, created in gloss on a matt background.



Skymark's 394-seat A380 will feature 14 business seats in addition to 'premium' economy

## domestic bliss

Skymark takes a fresh approach to its all-premium-economy A330 cabins

01. The green seat fabric is a whimsical reference to the first class 'Green Cars' on Japanese long-haul trains – another Skymark competitor

02. A sneak peek at Skymark's first A380: the painted vertical tailplane being loaded on to a Beluga at Airbus in Hamburg, before being taken to Toulouse, where final assembly is under way

In the highly competitive domestic Japanese market, low-cost carrier Skymark is endeavouring to stand out from its rivals. With its seven new A330-300s coming on stream between now and 2015, an opportunity arose. The solution? A premium economy standard, sold at standard economy prices.

The 271-seat single-class configuration offers Weber 5810 seats configured 2-3-2, all 19.3in-wide, and most with a 38in pitch, complete with two-way headrest, leg rest, meal table and pull-out cocktail table, plus a large centre table between seats.

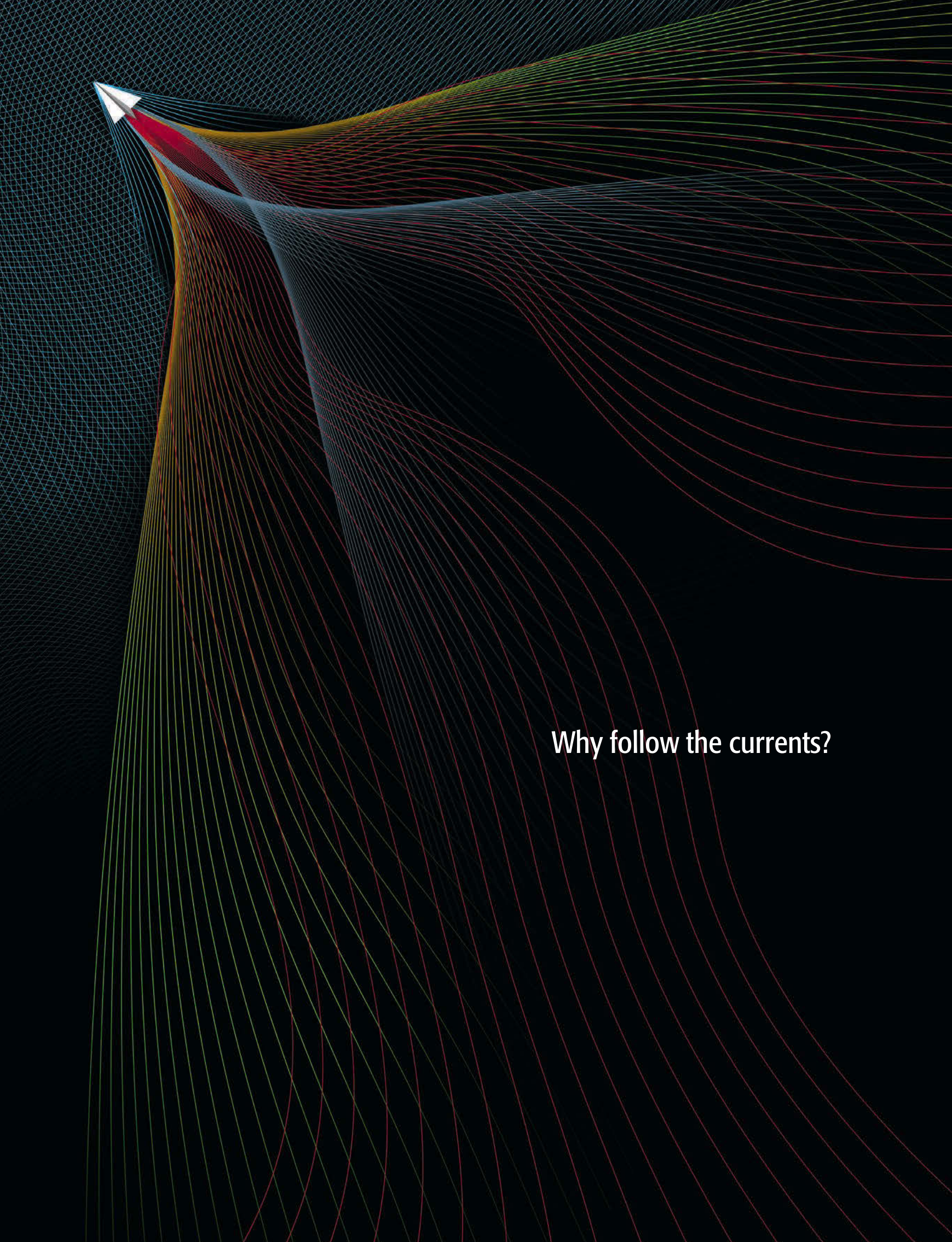
The A330s will be used on the high-traffic Haneda to Fukuoka, Okinawa and Sapporo routes, all of which take up to three hours. Such short routes might tempt customers toward the cheapest fare rather than the best value fare, but Daniel Baron, owner of LIFT Strategic Design, the Tokyo-based design agency that created the cabins, disagrees: "Some might say, 'Oh, who cares, it's just short haul', but in a 24/7 world of non-stop stress, two-to-three hours are enough for business travellers to recharge with a power nap. Skymark can succeed with such a configuration because its operating costs are low."

The aim of the cabin design was to create the feeling of an airy urban café, in keeping with Skymark's brand image, intended to portray a casual, approachable and flexible airline. The feel was achieved through a fresh, laminated green seat fabric from Botany Weaving, coupled with pale grey headrests trimmed in Perrone

leather, complemented by birch effect inlays for the table surfaces, supplied by Kydex.

The seats were lightly customised to suit the airline while minimising costs, the biggest change being a widening of the seatback cushions to close the gap between them and create more privacy. The corners at the top of the cushions and above the centre armrests have been rounded to prevent a heavy, bulky look, particularly in the triples.

For a premium economy-standard product, there is one notable omission, however: IFE. Skymark decided that the investment required to offer installed IFE was not in line with its low overhead strategy. With Japanese pax happy to watch content on their own PEDs, the airline was free to focus investment on what its management says is the top priority for Japanese travellers: seat comfort. In-seat AC power for each seat helps support PED needs.



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### How it worked

Air France does not have an in-house design team, but its branding and marketing departments had a lot of input into the seat programme. The marketing team has staff that specialise in cabin interiors, and who gave the Design Investment team direction on quantitative elements that had to be satisfied, such as the seat and bed specifications. Branding, meanwhile, gave direction on how the design and functionality should reflect the airline's values. Practical considerations such as maintenance and certification were handled by various other Air France teams, and then of course Design Investment worked closely with Zodiac on the seat specifics.

## haute couture

It's the biggest moment in Air France's revitalisation plan – the unveiling of its core long-haul business seat

The latest stage in Air France's €500m 'Best & Beyond' plan to become more competitive through creating greater corporate efficiency and a better passenger experience has been revealed. This is a major unveiling: a new business-class seat for its core long-haul fleet of 44 B777s.

Several seat models were evaluated, but passengers will enjoy an authentically French experience on board, as Zodiac Seats France was selected as the supplier. The specific model is the Cirrus, chosen as it offers three key 'Fs': full direct aisle access; full privacy; and the big one – a full-flat bed. The outgoing seat, although only three years old, is already out of date as it is an angled lie-flat model. There were a few issues with cabin density, but the team made it work by shortening seat pitch to 42in, while retaining a 1.8m bed length.

Brandimage was brought in for some of the cabin styling and branding, while Design Investment handled the comprehensive redesign of the seat. As Mark Collins, a partner at Design Investment who headed up the project told *Aircraft Interiors International*, since the project began in summer 2011 the seat has been heavily redesigned; apart from the base seat mechanics, there are no shared parts at all. Some of the design changes also related to the airline's "very ambitious" weight loss targets.

The backshell has a full 3D profile in order to create a 'cocoon' effect, with a swooping bumper line that separates the dark and light laminates – "almost automotive in its design", says Collins, adding that "the big swoop adds some French flair". Within the shell, a signature Air France padded headboard clad

Cirrus is also being considered for Air France's future B787 and A350 fleet

in Ultraleather (selected due to some certification issues with real leather) gives a sense of comfort, as does the soft adjustable headrest and the 22in-wide seat.

The stowage areas are also custom designed, including an upper compartment featuring a series of straps for securing small items such as phones and passports, a cocktail table, and a shelf to stow and charge a laptop or tablet.

The team also expanded the IFE screen to a 15.6in Panasonic HD model, and mounted it further to the front of the passenger than in many other Cirrus designs, so it only has to be pulled out by around 30° rather than nearly 90°. The IFE offer is completed with a touchscreen handset, a completely redesigned user interface, and over 1,000 hours of entertainment content. Between June 2014 and summer 2016, 2,102 of the seats will be installed on the B777 fleet.

- 01. The key to the success of Air France's long-haul business class: a fully flat bed
- 02. Lightweight and practical straps hold small items in the upper stowage
- 03. The shape of the shell makes the passenger feel cocooned, while also facilitating inflight service

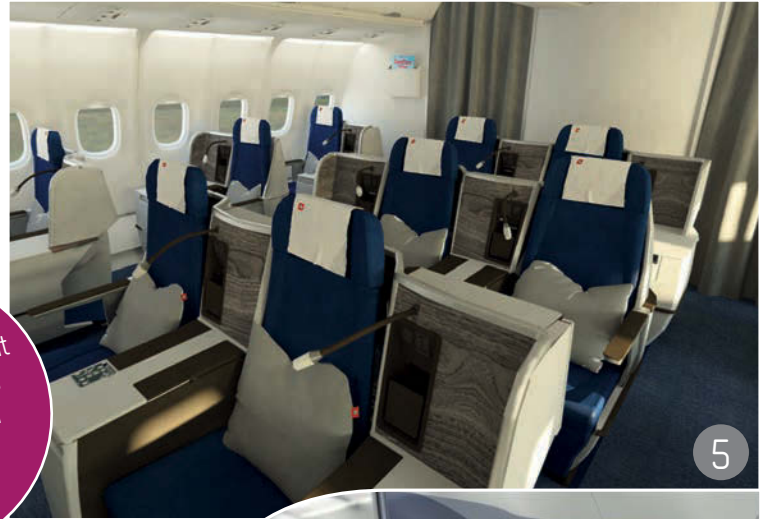
# staggering progress

Thompson Aero Seating, a small but growing company, is beginning to make big waves in the business-class market with its Vantage model, which combines cabin density with a unique offer. Here are some of the highlights in the seat's career



2

Find out more about Thompson Aero's future plans on page 172



5



1



3



4

1

## Swiss

In 2008, Swiss International Air Lines became the launch customer for the Vantage. Forty-five of the seats were installed in distinctive staggered rows of 1-2-1 and 2-1-2 on its A330-300s, creating an innovative passenger offer, while also ensuring comfort through a 45in pitch, 20.5in width and 79in lie-flat bed. Of further note was the use of Lantal's pneumatic air cushions, which created a saving of 4kg per seat compared with conventional foams, according to the airline. As Paul Estoppey, Swiss's head of cabin development told *Aircraft Interiors International* at the time of launch, "As soon as we saw the Vantage seat, we knew they had solved the puzzle and that we were looking at a win-win product for both airline and passenger."

2

## Brussels

Brussels Airlines' €30m investment in 2012 to revamp the interiors of its wide-body fleet, comprising five A330-300s and two A330-200s, saw another selection of the Vantage. For business class, 30 Vantage seats were fitted in the distinctive staggered rows, meaning that 24 seats have direct aisle access, of which 10 are 'king' single seats. As well as a 78in fully horizontal bed, the Brussels version also has a blue LED mood light integrated in the seat at three different points: at the storage, at the footrest and at the headrest. The light has three automatic modes linked to the seat motion, but is also adjustable by the passenger (but not controllable by cabin crew).

3

## Austrian

Following major work on refreshing its medium-haul fleet, Austrian Airlines is continuing its €90m+ investment by fitting its entire long-haul fleet of 10 B767s and 777s with new cabins, featuring new economy seats, an improved IFE system, and Vantage seats in business class. The seat has been designed to the airline's specification by an in-house team, and it converts to a 79in bed. Lowerable armrests widen the seat from 20in to almost 24in, creating even more personal space. The LOPA allows four out of five business passengers in a B777 to enjoy direct aisle access, while in a B767, all business-class guests can directly access the aisle.

4

## JetBlue

New York-based JetBlue, an innovative low-cost carrier, has received a lot of interest lately, mainly due to the imminent arrival of its new A321s. The reason? The airline is moving from offering a single seating product, to offering three, with the Vantage double and single seats. Going even further, JetBlue has done some extensive customisation work on the seats and added a door to the single to create a mini suite. The trickiest part of the whole project was working out how to introduce such decadent seats to the cabin without introducing the feeling of hierarchy. To find out how the JetBlue design team managed this, read our feature on page 112.

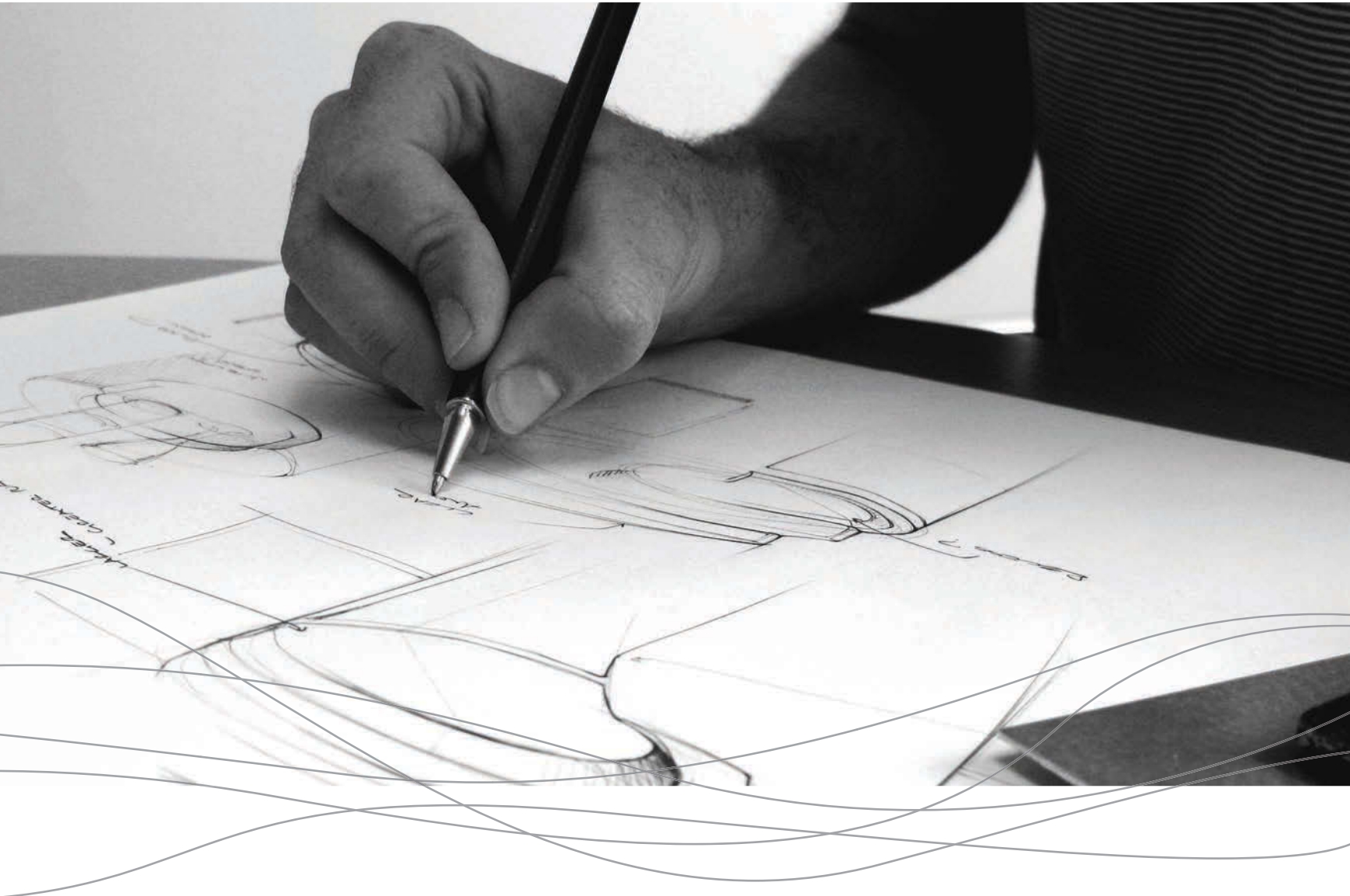
5

## Edelweiss

Another Austrian customer. In May 2014, the Edelweiss Air long-haul fleet will undergo refurbishment to improve the cabins. In business, the Vantage will offer a 79in bed, and will also be fitted with 16in Panasonic X Lite HD IFE, as well as the optional massage function. Extras to enhance the experience will include the use of Sennheiser premium headphones, a new and upgraded meal service, a wide selection of newspapers and magazines, eye shades, socks, ear plugs, and a toothbrush and toothpaste. As a final touch of luxury, Formia is supplying Edelweiss with a specially developed unisex kit containing products from the well-known global luxury brand Chopard.

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## shapeshifters

A pair of galley concepts created by Zodiac reclaim wasted front monument space to enhance the passenger experience

Zodiac Aerospace has found that there is underutilised and sometimes inaccessible space inside front-row monuments in business class. However, by pairing the Cirrus Skylounge seat with a front-row monument that merges with the lavatory and a U-shaped galley, that wasted space can be reclaimed and redundant walls eliminated. The result? A larger galley and lav, and more space in the aisle for a luxury such as a media display or self-serve bar. According to Zodiac, even if 10in is added to the front row seat pitch, the Cirruslav can still be expanded by 10in, and the galley expanded for 30% more catering capacity, aided by innovations such as double-depth ovens.

The U-shaped galley is just half the story though, as Zodiac has also devised a T-shaped galley and SkyLav scheme, again in conjunction with the Skylounge seat. The design again seeks to utilise the space usually wasted to the sides of the footwell in the front monument, and achieves a greater increase in capacity over an M2 galley, by using a three-cart lift system and using the extra depth to double the capacity. The benefits are many: the SkyLav can be expanded by 10in to create a larger area or a PRM facility, 11in of pitch is added

to the outboard seats, and the complete elimination of the G4/M1 galley creates an extra 37in of seat pitch in the centre seats – all without any loss of galley capacity. As a further benefit, as with the U-shaped concept, enough space is created on the right-hand side of the cabin for a self-service bar, and by the entrance for a media panel.

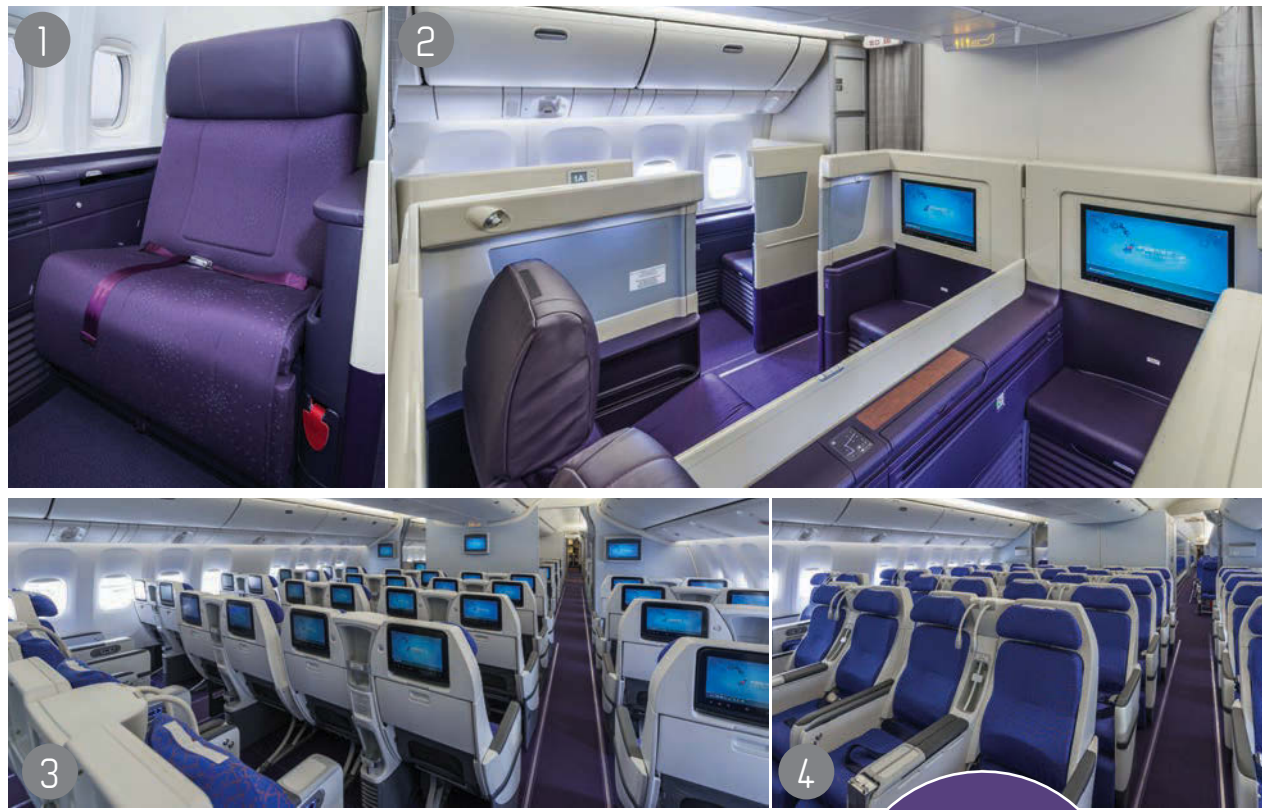
Thomas Lee, director of marketing and innovation at Zodiac's galleys and equipment segment stated, "Our focus is on revenue enhancement for airlines. In coordination with many Zodiac businesses, we have created the T- and U-shaped galleys. When these are combined with Zodiac seating products, more revenue-producing seats may be added to typical LOPAs."

Zodiac has also developed a front row G2 galley with integrated airbags, allowing seats to be fitted closer to these monuments

- 01. The T-shaped galley concept creates an extra 37in of pitch in the centre seats
- 02. The U-shaped galley can allow an extra 30% catering capacity

### RIVAL RECIPES

	Full-size trolleys	Half-size trolleys	Standard units	Steam ovens	Beverage makers
Typical M1 galley	7	0	12	5 (32 meal)	3
U-shaped galley	7	4	17	4 (64 meal)	5



# southernbelle

A four-class Boeing 777-300ER has joined the China Southern fleet, boasting a new premium economy cabin

China Southern's impressive long-haul fleet also features A380s and B787s

- 01. A 33in-wide seat offers real comfort in first class
- 02. The Venus suites are specified with a generous 82in pitch
- 03. A great premium economy cabin, with 38in pitch and fixed-shell seating
- 04. The seat fabrics pick up on the colours from the livery

The first of China Southern's 10 B777-300ERs has arrived, and it's a stunner in four classes. At the aircraft's delivery ceremony in Seattle, the airline's vice president, Dong Suguang said, "As always, the comfort of our customers is front and centre of our design process. This brand-new aeroplane features so many highlights and we believe the results represent a very significant upgrade in the products we can offer."

The first-class cabin looks fresh, with the seats' purple textiles and leathers highlighted against clean white shells. The cabin boasts four Contour Venus suites arranged 1-2-1, which, at 1.52m high, offer a real feeling of privacy. And with an 82in pitch and a 33in-wide seat, it offers real comfort too, while a 23in HD IFE screen offers big screen entertainment.

Business class – also configured 1-2-1 but in a staggered layout – features 32 Sogerma Solstys seats offering a fully flat bed 76in-long and 29in-wide, and a three-point belt to aid safety. The shells are again white, with a pale blue seat textile.

For the 227-seat, nine-abreast main cabin, the B/E Aerospace Pinnacle was selected. At 19in-wide and with a 32in pitch, the seat offers several comfort features, including cradle-style articulation, an adjustable headrest and footrest, 8.9in IFE screens and USB ports.

The big news, however, is the all-new 44-seat premium economy cabin, which China Southern calls

the "jewel" of the B777-300ER. A fixed-shell B/E Icon was chosen, configured 2-4-2, and it offers a 38in pitch and a 123° recline. Features include a large tray table, a cocktail table, a footrest, a 10.6in IFE display, a power outlet, a multiport connector for personal devices and extra stowage space.

The aircraft is also the first to fly with the fourth generation of Thales' Android-based TopSeries Avant IFEC system. While all classes enjoy touchscreens, in first and business, passengers also have HD and Touch PMU handsets. System programs are offered in five languages, and in addition to film and TV content, passengers can access interactive 3D maps, 12 games, flight information, e-books, e-shopping and a picture viewer. Electronic surveys are available to support China Southern Airlines' passenger-airline relations.



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# testbeds

Who better to try out an airline's latest ideas and prototypes than passengers? Airlines around the world are unveiling new research and promotion ideas



When trialling Lufthansa's BoardConnect for its new Red IFE system, Virgin America used #nerdbird, a special A320

**1 Delta's Beta Plane**  
Delta's Ideas In Flight programme is a means by which the airline can test new products and services and gather real-time feedback from customers on board the 'Beta Plane' and via Facebook. Customers participate by accessing the Ideas In Flight website for free while on board transcontinental flights via the inflight wi-fi and through the dedicated tab on the Delta Facebook page. Ideas under review include new food and beverage offers, IFE content selections, comfort and the general passenger experience. Tim Mapes, Delta's SVP of marketing explained, "Ideas In Flight puts customers at the heart of our process. They know better than anyone what it takes to make flying better, and their valuable insights and feedback will help shape new initiatives."

**2 Iberia guinea pigs**  
Keen to gain publicity for its new A330 cabins, and to gain a little more customer intelligence, Iberia came up with the idea of auctioning all 232 seats on a return flight from Madrid to New York via social media. More than 17,000 bids were placed for the #SocialFlight via Iberia's Facebook page, creating a lot of publicity. Meanwhile, the airline could check the Facebook profiles of the winning bidders to learn their publicly declared likes and preferences, and use this information to tailor personalised service and attention during the flights. Even better, these social media-savvy paying passengers are then encouraged to share their Iberia experience via online video sites such as Instagram. If you fancy being a #guineapig, the promotion will be repeated to other destinations.

**3 Xoom to Vegas**  
When Mexican LCC Volaris wanted to trial tablet-based IFE, and Motorola Mobility wanted to introduce potential customers to its Xoom tablet, passengers on a Mexico City to Las Vegas flight were treated to an unexpected trial experience. Each passenger was loaned a tablet to evaluate and enjoy during the flight, in what promises to be a regular form of cabin research for the airline – and for Motorola. "We are quite pleased to carry out this project with Volaris, and to spearhead this initiative for both industries throughout Latin America. We expect to have great acceptance from Volaris passengers, who will also be able to enjoy upcoming promotions with the devices," said José Luis de la Vega, marketing director at Motorola Mobility.

**4 Jumbo small steps**  
A big thing currently missing from the British Airways fleet is wireless connectivity. The airline is still in the process of deciding its strategy on this technology, but to help matters, one of its B747s is running a trial of Panasonic's Global Communications Suite, which offers wi-fi, mobile phone connectivity, media streaming to personal electronic devices, as well as live TV. Customer feedback during this year-long trial will help guide BA's strategy of how it should proceed with IFE and connectivity. With a fleet of around 270 aircraft, BA is right to be cautious in its approach. However, a little more feedback from the business travellers can be gleaned from the all-business London City to JFK route, which offers an OnAir system.

**5 Chromebook tests**  
Back in 2011, when Google was looking to promote its new Chromebook laptop, it teamed up with Virgin America to offer passengers the opportunity to 'test-fly' the device for free. Fliers could 'check out' a Chromebook at the departure gate and try out the computer, helped by a free Gogo wi-fi session. Of course this also helped promote the fact that Virgin America was the first airline to offer fleet-wide wi-fi. As Porter Gale, VP of marketing at the airline said, "As another California company known for connecting people in new ways, Google has been a key partner from our first flights in 2007 – powering the interactive Google maps on our Red platform. We're delighted to team up with Google yet again in a way that keeps our guests entertained and connected."



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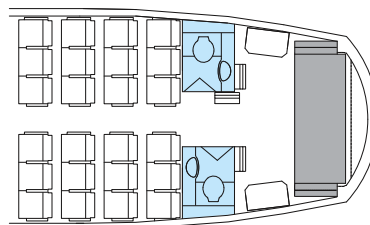
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# ISIS Complete Interior System

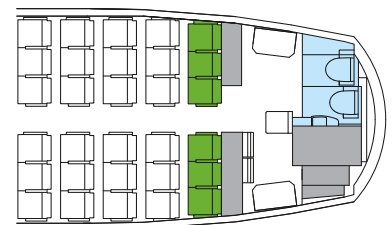
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Current A320



ISIS A320

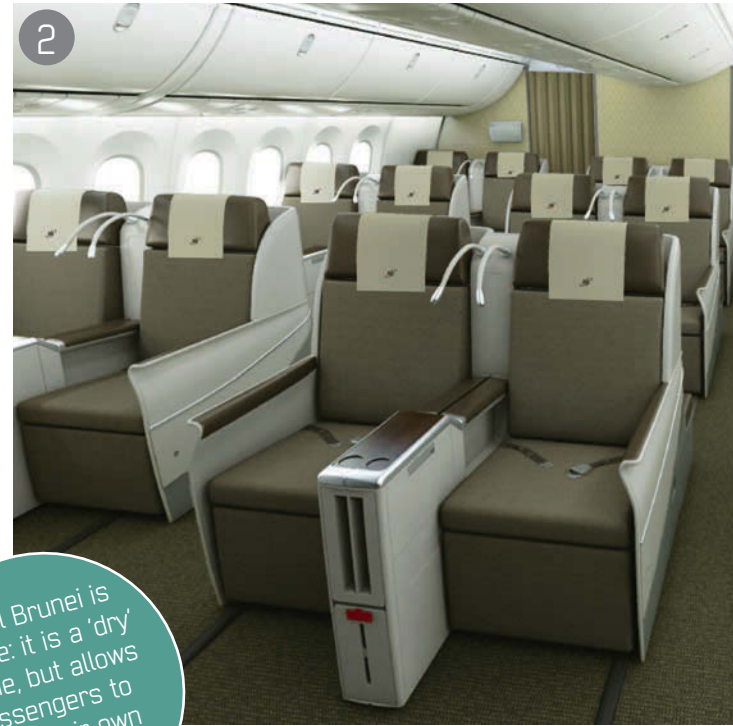


*Flying on the world's largest airlines in 2014.*

## A whole new Brunei

The arrival of the B787 marks the completion of Royal Brunei's rebranding programme, which includes a new livery and logo, being rolled out across the website, social media and new lounge and ticket office environments. The more modern look and experience has been promoted through friendly social campaigns, such as 'Smile Squads', who go out and met the public as far afield as Australia and London to spread smiles and good cheer – as well as some information on fares and routes.

Dermot Mannion, deputy chairman of Royal Brunei, explains, "This redefinition is not merely an ad campaign, but rather a long-term commitment to our passengers to create a family-like, peaceful and tranquil atmosphere with high-class customer service."



Royal Brunei is unique: it is a 'dry' airline, but allows passengers to open their own alcohol on board

## sultanateswing

The final element of Royal Brunei's new image has been unveiled – its Dreamliner interiors

01. Business passengers enjoy 15.4in eX2 IFE
02. The overall cabin palette is serene and luxurious
03. The use of aqua and pale blue seat covers helps break up the main cabin

The arrival of five B787s heralds the introduction of Betterfly, the new, modernised Royal Brunei experience – and the first Southeast Asian Dreamliner. The all-Dreamliner long-haul fleet is intended to make the airline more competitive with rivals flying between London, Brunei, Dubai, Hong Kong and Melbourne, among other routes.

In the 18-seat business class, configured 2-2-2, the airline opted for the Contour Aura, a popular choice from the 787 catalogue, selected in the fully lie-flat specification. To further enhance premium passenger comfort, Royal Brunei also opted for electric actuation for the leg rest and foot rest, a four-way manually adjustable headrest, and a lumbar massager. The seat pitch is 79in and bed length is 77in, including the ottoman. Overall the cabin is finished in neutral tones, including the textile seat covers, leather-covered headrests, armrests and ottomans, and the timber finish on the table surfaces. To add a little national flavour, traditional Bruneian patterns appear on the monuments.

Another option selected was the largest IFE display available for the seats: a Panasonic eX2 system with 15.4in touchscreen LCD monitors, complemented by noise-cancelling headsets, in-seat PC power and USB ports. Content is provided by IFE Services.

Back in the 236-seat main cabin, Weber 5751 slimline seats were selected, with a semi-articulating recline and four-way adjustable headrest. The seats are configured 3-3-3, with 27 seats at a 34in pitch, 197 at a 33in, and 12 at 32in. Main cabin passengers can also enjoy the eX2

system, through 9in Eco touchscreen seatback monitors, complemented by integrated USB ports and PC power, with two ports per triple. The main palette is consistent with the business cabin, with variety added through alternating blocks of aqua and pale blue seats.

The crew has also been given a makeover, with new uniforms that evoke Brunei tradition. The female crew blouses are detailed with traditional songket patterns and, depending on seniority, will be coral dust, morning sky or fresh mint in colour (pink, blue or green in everyday terms). The look is finished off with matching headscarves and flowing chestnut brown skirts. Male crew, meanwhile, wear chestnut brown three-piece suits, with Malay-inspired shirts that pick up on the same colours.

It all comes together well, which is no surprise considering the whole new look was predominantly developed and designed internally at Royal Brunei.

# NappaTex: Designable Leather

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**YARWOOD**

Aviation

# riskybusiness?

As Qatar steps in where many have failed, which airlines still offer all-business flights?

There have been many all-business casualties over the years, including Silverjet, Eos, Hong Kong Airlines, MAXJet and Midwest Airlines



1

## Doha diamond

Qatar Airways has announced the launch of a daily all-business service from its hub in Doha to London Heathrow. The service will be the first of its kind in the Middle East, with a 40-seat A319 in a 2-2 configuration with customised full-flat B/E Diamond seats. Those who have flown on Qatar's B787s will be familiar with the Super Diamond seat, with its little brother being a little more compact for narrow-body use. Window passengers may have to step over their neighbour to access the aisle. As with the rest of the Qatar fleet, passengers can pass the flight time – around seven hours – by watching the Thales IFE system (branded Oryx), which offers more than 900 entertainment options including movies, television, video games and music.

2

## NY-Lon club

A classic among all-business flights, the British Airways Club World London City service has been hustling between the financial hearts of London and New York since 2009 – albeit with a brief stop in Ireland's Shannon Airport for fuel and US immigration pre-clearance. The A318 features 32 fully flat seats, in just eight rows. The only feature missing in the seats is embedded IFE, with guests instead being offered the use of an iPad loaded with content, and UK, EU and US power sockets for powering laptops and other PEDs. However, the A318 has something its bigger transatlantic siblings don't: an OnAir email, text message and internet service.

3

## An actual bizjet

Lufthansa pioneered the all-business concept in 2002 with the launch of its Business Jet flights between Newark and Düsseldorf. Now offering 44 lie-flat seats on its 737 BBJs that fly the Munich routes, and 48 lie-flat seats on its A319 ACJs on Düsseldorf routes, business travellers can get a taste of what their private jet-owning CEOs enjoy. Other than a more exclusive experience, advantages of these flights include a more personal service than regular flights, short boarding times, bigger seat pitches, more generous table tops and embedded IFE.

4

## French fancy

Back in 2007, Paris-based operator L'Avion was operating two B757-200s in a 90-seat all-business configuration from Paris to Newark. However, when BA bought the airline a year later, it decided that while the business jet feel worked, its capacity needed a little fettling. But, while this is no longer a single-class offer, it does have something special. Under BA's guidance, the new entity of OpenSkies began flying with a 12-bed and 70 business seat configuration. A few tweaks later, and OpenSkies' three B757s now offer a three-class service. However, each class is still special, and seat count remains low, at 114. The business cabin has just 20 lie-flat seats, while premium economy is 28 seats, and economy is 66. All guests can enjoy iPad-based IFE.

5

## The next contender?

Remember L'Avion, the Paris-based all-business operator we mentioned? The company founder, a young entrepreneur named Frantz Yvelin, is rumoured to be on the brink of launching another business-only carrier. Named Dreamjet, and being set up together with Peter Luethi, the former Jet Airways COO, the carrier is predicted to offer flights from Paris to New York on B757-200s.



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# tanninglines

There are many leather companies competing in the aviation market, all of which offer a quality product, and all of which consider themselves to be the best. So what makes Yarwood Leather stand out in the market? According to managing director **Matthew Nicholls**, it comes down to one thing: innovation.

"Simply put, we believe we are the most technically advanced leather manufacturer in the market today. We were first with lightweight leather back in 2007, as dated in our patent, the first to have leather certified for heat release requirements for wall panels in 2009, and our latest heat release product (Hr+) pushes the boundary even further," he says.

Whether you wish to trim a first-class suite or a slimline economy seat, there is a suitable leather in the range. The heaviest products – Kensington and Avionappa – weigh in around the 800-850gsm mark, which is one of the lightest leathers on the market in the 'standard' category. For more weight-conscious applications, the lighter weight stable of products – Pegasus and Kansas – weigh in at 600gsm, and have been designed with touch, handle and physical performance qualities in mind. And for those seeking the lightest possible leather, the SupaLiteNT product typically weighs 400gsm. "It's arguably the lightest of the light," Nicholls says.

With a large order, even the lightest leather can be costly to ship, but Yarwood's CNC cutting service means the leather is pre-cut to the desired pattern, so the weight and dimensions of the packaging are minimised, which means lower transport costs. "We're the oldest European customer of Gerber systems, and have been operating Gerber Taurus leather cutters for over 14 years. We always hit our yield targets and regularly save airlines 20-30% on usage costs through clever cutting," says Nicholls.

"But perhaps the greatest benefit is that we can quote an airline a fixed per pax or per shipset cost that will not change throughout the agreed project. There will be no surprise phone calls saying that there was not enough leather or that there was an over-usage somewhere in the supply chain. I would virtually guarantee that through clever cutting, we can save an airline financially on almost any programme. With our qualified burn testing (seat oil burn and vertical burn) offered free of charge to clients, we make the process of change simple, easy and with as much risk removed from the supply chain as possible."

Of course, airlines seeking light weight – and they all are – consider artificial leather. Having worked in tanneries and with leather since he was 16 (we can't reveal how long ago this was), Nicholls is clearly biased in favour of leather, but he is convinced it really does offer advantages. "Leather has some



MATTHEW NICHOLLS, YARWOOD LEATHER

amazing organic qualities that artificial leathers simply can't compete with", he says. "They breathe, and the substrate – the hide – is much stronger and tighter than synthetics due to the interlocking nature of the fibres. But perhaps the best thing about leather is its unchallenged position as a luxury product. So, from the fare-paying passenger's perspective, there is without doubt a much higher perception of quality and luxury, even if just on a subconscious level. Synthetic simply doesn't and never will have that cachet. My view on synthetic leather? I'm probably too biased to give a sensible answer, but it would be short if I did."

So, if a cabin designer decides on a Yarwood leather, is it the start of a close relationship? "It's an involved process," Nicholls explains. "We have very good relationships with all the major design houses and we're very adept at responding to requests such as 'Can I have the sample 3% less yellow and can I have it in five days?' Which did happen!"

Speaking of lead times on orders, some lines, such as Pegasus, are always kept in stock, so typical lead times are around 48-72 hours from receipt of the order. Custom colours for, say, a single-aisle shipset can be delivered from colour approval within four weeks, and custom colour representative samples can be delivered to a designer's desk within 48 hours if a RAL, NCS or Pantone code is quoted, and within three to five days if they are hand matched from a sample.

## HAMBURG HIGHLIGHT

Yarwood always comes up with something new at Aircraft Interiors Expo – camel hide was a 2013 highlight – and this year the company is launching a new NappaTex product in partnership with seating manufacturer Geven.

According to Nicholls, NappaTex combines the haptic and design qualities of fabric with the strength, durability, easy maintenance and cleaning of leather. This is a genuine leather product, not a reconstituted composition leather.

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# drivingseats

**Fahri Bayir, general manager of Turkish Seat Industries (TSI), discusses this young seating company's ambitious plans to expand its product range and geographical reach**

Entering an aircraft seating market already boasting several highly regarded companies, from giants to more boutique outfits, is a bold move – but in January 2012, TSI did just that.

Fahri Bayir, general manager of the company, explains the decision: "With the increasing demand for air transportation, and growing passenger needs, aircraft cabin interiors have become the ultimate and most important item for airlines. Retrofit project numbers and cabin interior orders have increased dramatically over the past decade. Additionally, the increasingly positive signs for the aviation industry following the global recession of 2009 have increased the number of new aircraft orders. This implies that new players in the market should rise up to offer new designs with great quality and low costs. There are so many opportunities to be realised in this market, and TSI is now one of the players in this aggressive evolution."

That's not to say that TSI is without experience in seating, though, as the company was formed as a joint venture between Turkish Airlines (THY), Turkish Technic and in Assan Hanil, a large Tier 1 automotive interiors supplier. As well as experience in transportation seating, Assan Hanil offers experience related to production methods, lean manufacturing and supply chain management.

"This experience gives us more flexibility," says Bayir. "Our key advantages are flexibility and short lead times. We are able to supply our current range of seats in six months, including customisation and certification, partly thanks to a modular concept for seat components and accessories. We can even design and certify completely new economy-class seats in 14 months. Our supply chain goes all around the world, including low-cost countries, and this means we are able to produce both big and small quantities of seats. Also, using plastics and aluminium instead of composites in the construction helps us to offer short lead times. For example, we can produce plastic injection moulds in four weeks. We are also very assertive in the supply of spare parts, with an average lead time of one week for after-sales support."

TSI views the customisation of products as a key factor of success in the market. This is aided by having ADOA certification from EASA and an in-house R&D centre, as well as good links with design houses throughout Europe.

So the company has set itself out to be unique in the market. What makes the Elesya economy seat,



FAHRI BAYIR, TURKISH SEAT INDUSTRIES (TSI)

**COOKING UP A STORM**  
Sister company Turkish Cabin Interior (TCI) is another bold entrant to the market. This company, established in December 2010, is aiming for a 20% share of the global galleys market. For more details, see page 177.

TSI's main product at present, unique in the market? "We didn't focus on just one area such as weight, price or comfort," says Bayir. "Elesa is the optimum balance of price, weight, comfort, living space, quality and reliability. We initially designed this model according to THY's expectations, but it has many customisable features. Modular design is essential in order to meet the different expectations of customers."

Ten shipsets of Elesya seats are currently flying on THY's B737-800s, with a further 25 being delivered before June. TSI is also supplying economy seats for THY's B777 and A330s, with shipments beginning in Q4 2015. In tandem, TSI is also working to achieve line-fit offerability with Boeing and Airbus by late 2015.

Further plans include a long-range economy seat, which is currently undergoing validation tests, and a single-aisle business seat concept, which is currently undergoing detail design and will be unveiled at next year's Aircraft Interiors Expo. The longer-term plan is to offer a whole range of seat classes by 2020, and to open several production locations over the next 10 years, piggybacking on Assan Hanil's plants in the USA, China, India, Europe, Brazil and Korea.

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# moveon

**BRIEF:** We've seen many exciting concepts for the A380, but they tend to focus on premium passengers. Can we have a stylish concept for the economy cabins please, which will enhance passenger enjoyment and health?

**DESCRIPTION:** Jan Meissner of the Muthesius Academy of Fine Arts and Design in Kiehl, Germany, stepped up to the challenge with COS (Concept of Space), a concept that aims to redefine space in long-haul economy.

As you enter the cabin, the 'sighting sail', a transparent screen mounted on top of the seatback, shows the seat number, as well as the passenger's name and social media avatar. Once in the seat, the sail also helps to define the space and add to the feeling of privacy, and can add a little personal mood lighting.

Beyond the technology, the seat itself is flexible, and adapts to the passenger's shape through a combination of morphable material, an integrated piezo-foil structure, and an interactive interface. Depending on passenger preference, the seat can form to the body passively, or automatically, also adjusting to move the thighs and buttocks occasionally, aiding blood flow. The headrest is also adjustable for comfort and privacy.

However, the real star of the show is the seatback plate, which is a semi-transparent LCD interaction surface that maintains the front passenger's feeling of privacy, while also giving the passenger behind a sense of light and space. The multilayered GUI, operated via touch or gesture, can be used to adjust the seat or the environment (light or temperature), order food and beverages and, because the screens nearly merge, displays can be shared to make a panoramic screen. For flying fans, images from the camera mounted on the front of the A380 can be shown on the panoramic display.

If you fancy some real downtime, the tray table can be rotated to expose a soft sleeping surface, adjustable for height and reach.



**VERDICT:** It certainly looks great, and a great space in which to travel in terms of comfort, entertainment and health. However, with those great features come some problems: namely seat expense and weight. But, as ever, we must remember that the design is a concept, and if any of the COS's features inspire future long-haul economy seats, that will be great news for travellers. Better still, if these are economy seats, imagine how good premium economy would be.



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# urbanlegend

**BRIEF:** In society on the ground, individuals connect and form into groups based on personal and professional preferences, so why should airline passengers be arranged randomly, with the environment focused on the seat? Why not arrange the cabin more like a city, with a beating heart where individuals can interact, and suburbs where they can enjoy peace and privacy? These may seem like contradictory aims for the flight experience, but we'd like to see what Delft University of Technology in the Netherlands can imagine.

**DESCRIPTION:** Ideas such as seating choices made according to connections on social media, and wearable technology giving information on the cabin environment and fellow travellers are already underway, but the creators of the BWB interior – Christina Wang and Peter Vink from Delft University of Technology – predict much greater advances by 2050. The concept is a metaphor for a city within a blended wing aircraft, with the central 'tree hub' being a space for networking, shopping, buffet dining and multimedia information sharing. Prior to boarding, groups are formed according to suggestions and profiles from future versions of social media sites such as Facebook or LinkedIn, and from the booking system, and they then board via four parallel aisles to the seats. The hub seats are not organised in rows, but again in groups. Depending on a passenger's mood, they can book a group seat in the hub, or if they fancy a break from all the networking, a private sleeping cabin, or a single seat on the periphery, using the hub rather than the seat as a social area. The idea is that passengers will have a great flight experience as they can meet new contacts, walk around and enjoy the buffet, shopping aisle and facilities, and – depending on their chosen ticket – have as much privacy or peace as they wish, all increasing passenger well-being.



**VERDICT:** It certainly sounds like a great way to fly. However, dull as it may sound, the seat density is very low, with this fantasy space accommodating 504 to 700 passengers in the hub configuration (depending if sleeping cabins are specified), compared with a projected 800 passengers in a more conventional configuration. As a consequence, a flight with social spaces and a range of experiences may be just for those who can afford it – but then that is similar to today's situation. The best thing? People can finally meet all their Facebook friends in real life! Like.



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# plane sailing

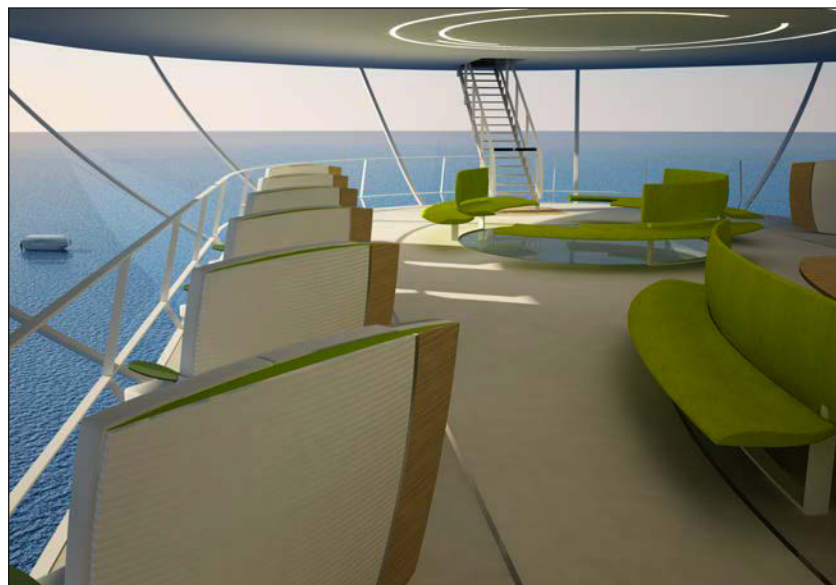
**BRIEF:** A glamorous craft is required for glamorous day trips, which can fly tourists from water to air, and really show them the sights, whether in the air, on the sea, or even under the sea.

**DESCRIPTION:** We've featured the imaginative work of the Toulouse-based Octuri design studio before, such as the huge Air Union inter-city aircraft, the intriguingly named Flagellum Oscillator, and the Horny Moon Airways space shuttle for honeymooners seeking weightlessness during their private celebrations. Believe it or not, this design, the Flying Yacht, is a rather more realistic proposition.

Hokan Colting, founder of the Canadian company Flying-Yachts Inc, has commissioned Octuri to design a sightseeing airship that takes off and lands on water. Octuri's proposal means that up to 40 passengers can enjoy a spacious 516m<sup>2</sup> cabin, entered through an airlock. This wide-open space is made possible because the hull's rigidity is created by cabin pressurisation, not through structural elements in the cabin. As the craft is all about the views, the cabin walls are made of transparent polycarbonate sheets, giving 360° visibility. Once the craft has landed, following a cruise at an altitude of 30-90m, guests can go back through the airlock and access the two outside balconies without any loss of cabin pressure.

The 40 seats, positioned at the front of the craft and diagonally at the sides, are occupied during TTOL and as desired during flight. For sociable flyers, there is a snacking area with two large tables and several bench seats between the outer seat rows, and a bar area at the rear.

For those seeking some inflight and on-aqua entertainment, besides the stunning views afforded by the large windows, there are two areas with transparent floors, offering vertical views when in flight, and a glimpse underwater when in floating mode.



**VERDICT:** Obviously this is a very cool concept and design, and it would be an incredible way to explore everything from tropical islands to frozen splendour. But then so many fantasy aircraft have been created by Octuri that this could easily be dismissed as just another nice idea. However, this is no mere fantasy, and a half-scale demonstrator model is nearing completion. If this idea – ahem – takes off, we would love to take a voyage on the Flying Yacht.



# newsensation

**BRIEF:** Thales' immersive IFE seat concept was a great idea, but in its prototype form it looked a little clunky. With the technology refined, it's time to refine the design with the help of some design experts in order to make the seat as comfortable and stylish as it is entertaining.

**DESCRIPTION:** In recent years, Thales has showcased many new technologies to enhance the IFE experience, including eye tracking to control the user interface; vibration feedback in the seat, linked to the audio output; and directional sound so a passenger can enjoy surround sound without headphones and without disturbing their neighbour. However, technology is one thing: for it to appeal to airlines, it has to look passenger-friendly.

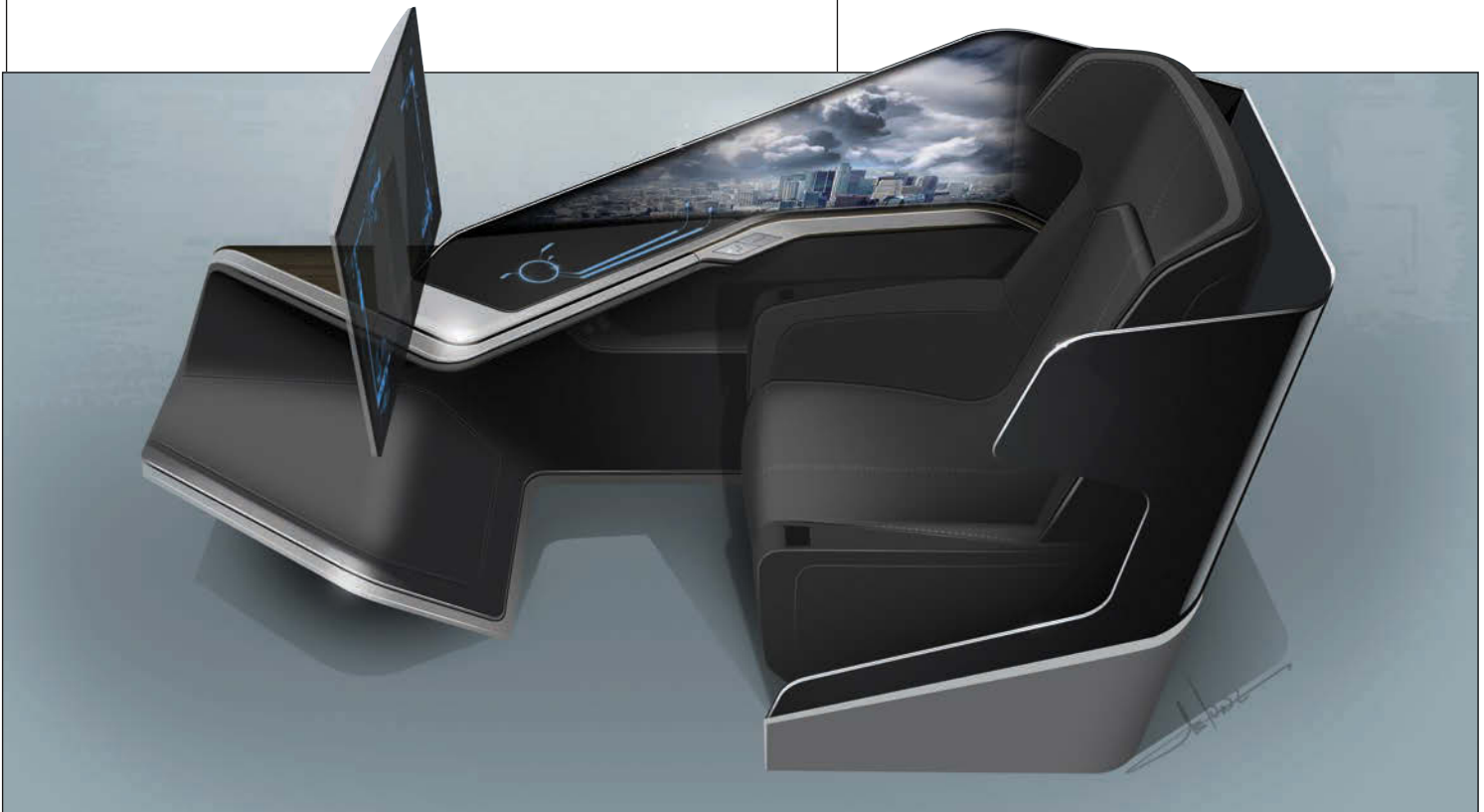
Thus Thales has teamed up with B/E Aerospace and BMW DesignworksUSA to create a more stylish design for this innovative business seat. Now a sharply styled outer shell houses an immersive environment that marries comfort and technology.

New technologies include a main display – an ultra-high-definition monitor mounted on a pivoting dynamic table – linked with eye tracking so that it moves with the user, meaning they always have an optimal viewing angle, whether sitting or lying down.

Note we said 'main display'. In a great example of technology being integrated with design, the side panel goes a step beyond a pleasant decorative finish, instead being an interactive virtual landscape. Linked with the main display, media from the IFE system or a PED can be sent between the screens by a swipe of the hand or a flick of the eye. Or if you feel the shell blocks the view out of the window, the landscape screen can show video feeds from outside the aircraft, or content from an interactive moving map.



**VERDICT:** The original immersive IFE seat concept was good enough to win a Crystal Cabin Award in 2013, and the design work that has followed has really made this a viable cabin product. Even technophobes can enjoy the comfortable and stylish in-seat environment as much as committed film fans. The only downside: the concept is five to seven years away from being launch-ready, according to Thales... and we can't wait to experience it.



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# boardinggames

Airlines are experimenting with many different ways of getting passengers on and off aircraft efficiently to help them achieve quick turnaround times, save money, and improve the travel experience

AUBREY COHEN



In some ways, boarding an aircraft is a maths problem. What's the fastest way to get a certain number of people, and their bags, down a jetway, through a door or two, and into seats laid out along both sides of one or two long, narrow aisles?

"It is no mean feat to get 400 people, and their belongings, into one place through small apertures and maybe we expect a bit too much sometimes," says Adrian Berry, a director at design consultancy, Factorydesign. "Ultimately, the airport is a big funnel, collecting from far and wide, and delivering through a small spout into a container."

But there's at least as much psychology involved. For some reason, many people think it's better to get on first (and thus be on the aircraft even longer), so you have to let the people who pay more and sit in the front get on before everyone sitting behind them.

And you've got to fend off passengers awaiting their turn to board and get those whose turn it is through the crowd of lurkers. The clamour to get on faster has gained some logical motivation in recent years, as checked bag fees have spurred people to try to carry aboard more luggage than the overhead bins can fit. There has to be a better way, right?

**THE CURRENT SITUATION** First, let's review what most airlines do, more or less. First class and other elite travellers board first, followed by people who need extra time to board or families with small children. Finally, everyone else boards by groups of rows, starting with the back of the aircraft.

The line of boarders stalls as people find their rows, stuff their bags in the bins (or search for bin space somewhere else) and squeeze past row mates already in place (or ask them to get up).

The back-to-front boarding system seeks to minimise delays from having to wait to get past someone seated ahead of you. But, given that it would be impractical to call rows one at a time, airlines use groups of rows, meaning there is still some waiting time.

This approach also crowds passengers together, a group of Arizona State University researchers notes in a paper on the subject entitled *The Aircraft Boarding Problem*.

"An obvious problem with the back-to-front approach is that the congestion created in a reduced area of the aisle among passengers of the same group results in impediments for these passengers to stow their carry-on luggage and to reach their assigned seat in an expedient manner," they state. "This observation leads to the







ILLUSTRATION BY SCOTT GARRETT



01

## aisle be back

Colorado-based outfit, Molon Labe Designs, is looking to licence the design of its Side Slip Seat. To aid ingress and egress and reduce turnaround times, the aisle seat slides over the middle seat during boarding to create around an extra 24in of aisle width.

When extended, using a button on the armrest, the middle seat remains set back, so all three passengers can enjoy some armrest space. Molon Labe also claims that the staggered design creates an extra 2in of width per seat triple on a B737, and 3in extra on an A320. For the latter, the design house considered adding an extra 1in to each seat. However, following consultation with stakeholders such as Bombardier (which has apparently expressed interest in fitting the seat in a 3-2 configuration on the C Series), Airbus, Boeing and the National Association to Advance Fat Acceptance, it was instead decided that all the extra width would be put into making a 21in-wide middle seat, in a similar idea to the Airbus Extra Wide Seat concept. This means that the person in the undesirable middle seat feels less crowded.

The seat is not a standalone solution though: given how the seats operate, a certain coordination of boarding order is still required.



USING TWO DOORS AND AN 'OUTSIDE-IN' METHOD SAVED 17 MINUTES



01. Molon Labe's Side Slip Seat. A great idea, but if passengers don't know how to operate it, that could eat into the time benefits

conjecture that a different boarding approach, where the groups are composed of passengers more dispersed throughout the aircraft, might actually perform better than the current back-to-front approach."

In the 1990s, Boeing developed the Passenger Enplane/Deplane Simulation computer model to evaluate passenger boarding scenarios and aircraft interior configurations. The model then validated the simulation's results by timing loading of different airlines' aircraft around the world and by running loading tests of a B757 using 600 non-Boeing people "representative of the typical travelling population".

Boeing's motivation wasn't wholly altruistic. At the time, Boeing was marketing the stretched B757-300, which at 178ft 7in (54.43m) was 23ft 4in (7.1m) longer than the -200 version, allowing approximately 20% more seats to be installed.

"Several potential B757-300 customers told Boeing that, based on their experience with other standard-body aircraft, they were concerned about the new aircraft's potentially greater turn time," said a Boeing spokesperson.

Boeing's research found that the total turnaround time for the B757-300 was just 6.5 minutes longer than that for the B757-200 using the standard boarding method. Most

interestingly for the rest of us, Boeing found that loading using two doors and the standard back-to-front method saved five minutes, while using two doors and an 'outside-in' method – loading window seats, then middle seats, then aisle seats – saved 17 minutes.

**REVERSE PYRAMID** The Arizona State researchers reported that Shuttle by United was one of the first carriers to try outside-in boarding, but abandoned the experiment and went back to the traditional approach.

The team piggybacked off Boeing's research in working with America West Airlines to come up with a better idea. They ended up with a 'reverse pyramid' method, whereby passengers boarded from the outside in, but also from the back to the front (not counting first class), so that window-seat passengers in the front of the economy cabin, for instance, would board after middle-seat passengers in the rear, but before the rear-most aisle-seat passengers. The Arizona team estimated that America West could cut boarding times by around 25% using this method, and by 37% if it also added a second gate agent to check boarding passes and identification. When implemented, the time saving was 26% with one agent, and 39% with two.



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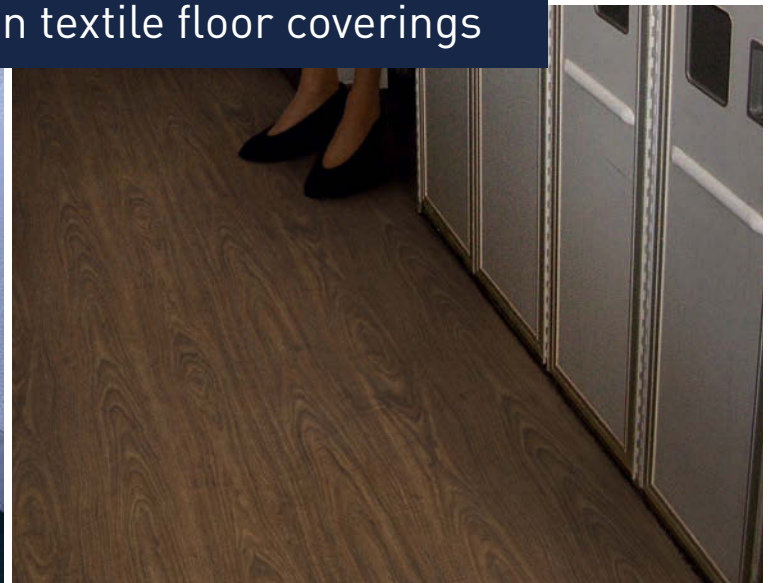
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## THE LA TIMES CALLED UNITED'S SCHEME A SYSTEM ONLY A MAD SCIENTIST COULD LOVE

America West, which merged with US Airways, gave up on the system in 2009, moving to one that gave earlier boarding to high-tier members of airline frequent-flier and credit card programmes, then people who saved the airline money by checking in online, then everyone else.

In June 2013, United Airlines revived the outside-in approach. According to a statement from the airline, "This method reduces the interference that may occur in the aisle as a result of someone having to move to allow another customer to sit in a window or middle seat," adding that families could still board together.

Writing in the *Los Angeles Times* in November 2013, columnist Michael Hiltzik called United's new scheme "a system that only a mad scientist could love". While the system has "some technical logic", Hiltzik wrote, "the real world interferes".

Letting families board together subverts the plan, as does boarding premium and privileged passengers first, he noted. He added that the system increases the chances that bins won't have room for aisle passengers' bags (although every system will leave someone holding the bag, so to speak, as long as there are more carry-ons than bin space).

AirTran, meanwhile, came up with a rotating system by which people with seats at the rear of the aircraft board just after first class, followed by people in the front of coach, and then people just ahead of the rear zone.

All this brings us to Southwest Airlines, which launched what sounds like a recipe for chaos in 2007. Customers are assigned a position in one of three boarding groups based on when they check in for their flight. They board with their group and then find an open seat.

"We listened to customer feedback about the type of boarding processes they would like to see at the airport," Southwest spokesman Dan Landson says. "Our unique boarding procedures have helped improve the overall travel experience for our customers."

No matter what Southwest says, other airlines see this as too chaotic for their customers. It also complicates efforts to use early access as a carrot to make more money from passengers. In fact, even Southwest isn't quite so simple. Passengers who buy a Business Select ticket get a boarding position no worse than A15. EarlyBird customers are automatically checked in 36 hours before their flight, earning an early boarding slot.

American Airlines tried a more organised variant of Southwest's system in 2011, after a two-year study found that randomly grouping passengers into boarding groups was better than any systemised approach. Of course, preferred passengers still boarded first.

## contain the problem

Jude Gomila, co-founder of San Francisco-based games company Heyzap, is an unlikely source of boarding innovation, but on his blog he has suggested the secret to rapid and stress-free boarding could be to 'containerise' the airline industry. He says, "Time, energy and human comfort is sacrificed daily because we cannot load/unload people onto airplanes fast enough. We end up wasting around 20 minutes on both the load and unload cycle (40 in total per trip). I suggest we take a leaf out of the shipping industry's book. As the book *The Box* outlines, the shipping industry was extremely inefficient and non-scalable before the standardisation of the 40ft-high cube container in the 1950s and 1960s. With standardisation, came speedy boarding, pre-loading, flexibility and efficiency."

Gomila's idea is to re-engineer aircraft so that the cabin is split into detachable sections, with passengers loaded at the gate into an air conditioned and powered section, which is in turn loaded onto the aircraft by a precision conveyor belt.

"We already do containerisation for luggage. Passengers and crew could preload onto the cabin at the gate, sorting out pre-flight checks before the base aircraft was even there! In fact, passengers could load into the glorified container straight after security and not have to walk to their gate," he states.

"Passengers would save time and energy, and the airline would have flexibility to use different airplanes as the base to carry the cabin. The cabin would become the differentiator, not the entire airplane. I understand the engineering complexity of such a system is high, but the shipping industry also once had the same barrier to entry and proved the model works," he concludes.

The system may raise more problems than it solves, but nevertheless, it's an interesting proposal.



A little trivia, courtesy of Vueling: The convention of aircraft being boarded from the left has its origins in the way that riders mount their horses

## it's quick to be square

Feel like we haven't really ventured outside the box yet? Try the 'flying carpet'. The 'carpet' is a gate area with squares arranged according to the aircraft seating plan. The first 20 to 30 passengers line up in the squares representing their seats, and then board.

"Because they are in logical row order, they arrive at their seats unimpeded, and no one has to push past anyone else," says inventor Rob Wallace, of Round Peg Innovations. And being well-spaced along the whole length of the aisle, passengers have plenty of elbow room to stow their bags and take their seats.

"Meanwhile, the next group of 20 to 30 are taking their place on the carpet, then head down the corridor, arriving at the aircraft door just as the passengers in the first group have become seated."

- 02. A Clarkson University research team led by Prof. R. John Milne (left) and undergraduate Alexander Kelly (right) has devised a bag-based boarding strategy
- 03. United's outside-in approach allows window and middle passenger to settle in without disturbance



American Airlines recently launched a new system under which passengers without bags for the overhead bins board just after all the preferred classes, and before everyone else. Virgin America tried a similar system but found it too hard to police.

**APPLIANCE OF SCIENCE** You don't have to be a particle physicist to have an opinion about how best to board an aircraft, but you'll probably get more attention if you are.

Enter Jason Steffen, of physics research institute Fermilab, based in Illinois, USA, who is more used to problems involving particle acceleration than passenger acceleration. "I had been thinking about this problem for two or three years and decided that I needed to either satisfy my curiosity or forget about it," Steffen writes in his personal research section of Fermilab's website. "I was able to squeeze two publications out of this work..."

"The upshot is that the optimal method is one that parallelises the boarding process rather than serialises it (like most carriers have done in the past). People standing in the aisle are just standing in line. Loading back to front just moves the line inside the aircraft, but is not much faster than loading from the front to the back."

Loading randomly is faster than traditional methods, Steffen found. Even better, he reports, is a sort of modified outside-in system that loads window seats one side at a time, then middle seats the same way and then aisle seats, while also loading every other row (so just odd- or even-numbered rows first), then filling in the rest.

**INDIVIDUAL ATTENTION** Steffen's approach would require passengers to be loaded in an extremely specific order.

## a US\$10 million idea?



Researchers at Clarkson University in New York have developed a boarding method that they believe may accelerate the process. School of Business Professor R John Milne and undergraduate student Alexander Kelly propose assigning passengers a specific

seat based on the number of bags they carry, meaning that luggage will be evenly distributed throughout the aircraft. Using the method, each row of seats would tend to have a passenger with two bags, a passenger with one bag, and a passenger with no bags.

"The new method would save at least several seconds in boarding time and prevent any one area of the plane from becoming overloaded with bags," Milne explains.

"You add that up over thousands of flights a day over the course of a year; it can really make a difference," Milne adds. "For instance, a large airline like Delta may be able to save about US\$10m a year."

The team has tested the method by running thousands of simulated aircraft boardings through a computer model, and claims that it works.

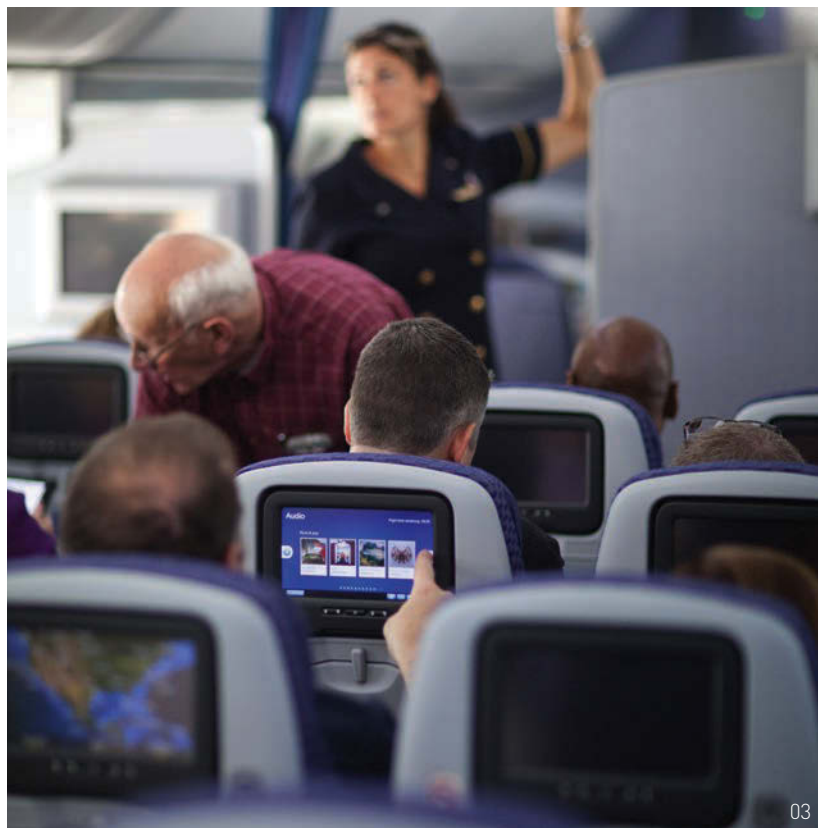
Belgian researchers Hendrik Van Landeghem and Annelies Beuselinck of Universiteit Gent in Belgium reached a similar conclusion in their paper, *Reducing passenger boarding time in airplanes: A simulation-based approach*, reporting, "The best sequences all require calling off individual passengers by their row and seat number."

They acknowledge this would be a complicated undertaking that could cause confusion at the gate, adding more time than is saved on board the aircraft.

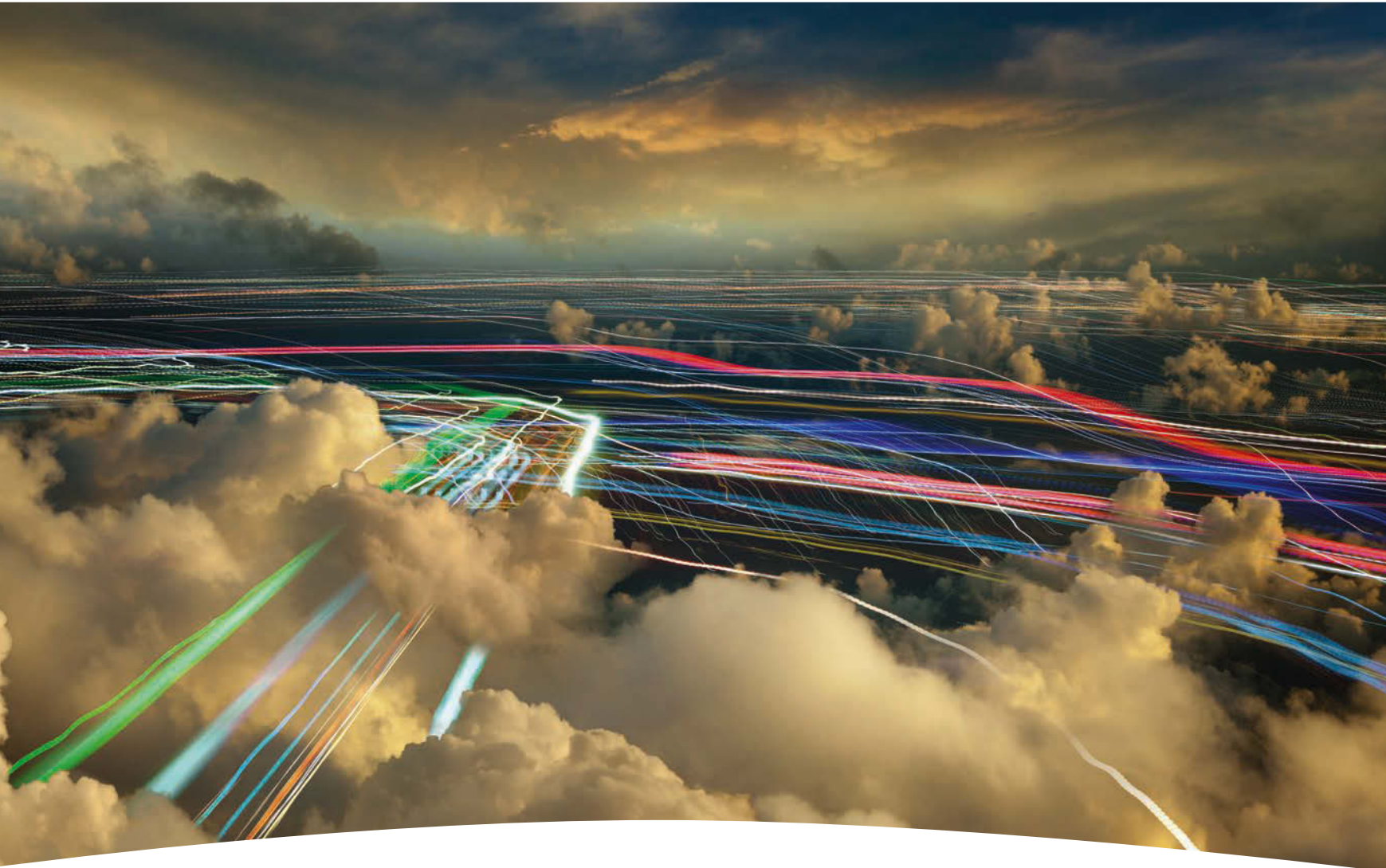
"Moreover, the fastest call-off method is not always perceived as being the best by the customer," they add. "Passengers do not appreciate over-complicated call systems. A compromise has to be found between simplicity of the call system and velocity of the boarding."

The solution could be found at your local supermarket deli counter, where "numbered tickets are used to control queuing of customers and eliminate line-hopping", they state. "The announcement of the next customer is through an electronic display. The same setup could be used at airport gates, with minimal investment, since the flight display at the gate could be programmed for this."

**PUCKERED-UP PIG** None of the variations on who is let on the aircraft in which order really works, JetBlue chairman Joel Peterson stated back in August 2013: "These solutions are lipstick on a pig. But lipstick doesn't make a pig fly."



# no interruptions



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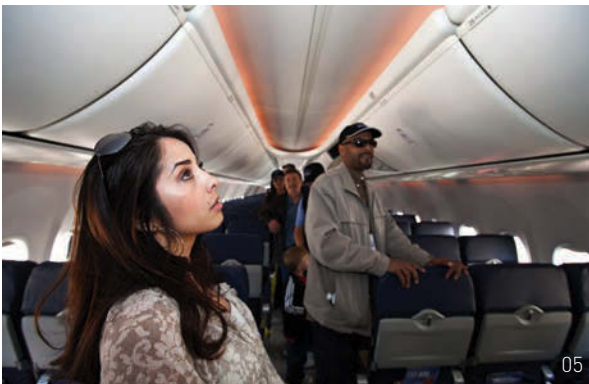


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Why? Because speeding up the slow boarding process isn't about tinkering with the order in which you let people on the aircraft. It's about the amount of time passengers spend in the aisle, hefting their bags into the overhead compartments, and stowing them under the seats. The more and bigger bags people bring on, the slower the line moves.

"Clever algorithms may shave off a minute or two – if they don't completely confuse passengers first. But if the industry really wants to speed up boarding, it'll have to stop charging for checked bags. Is that at all likely? With airlines profits under pressure, don't expect it any time soon," he said.

Unsurprisingly, given Peterson's stance, JetBlue doesn't charge for the first checked bag. Southwest allows two bags to fly for free. Spirit accomplishes something similar through opposite means: charging for both checked and carry-on bags – more, in fact, for the carry-on. But bins still fill up on Southwest, JetBlue and Spirit, because the increase in carry-on bags isn't just about fees.

"Passengers are keen to have their bags near them – in their 'vertical personal space'," explains Berry, of Factorydesign. "They will be keen to get to their allotted slot in the overhead bin and keen to organise all items so that their bag is near them – holding up the passengers in the aisle and slowing the process considerably..."

"This phenomena, though, is born from airport experience. The need to keep your personal items close to you; to make sure that they don't get lost in transit or take forever at the other end."

## LCCs to try bespoke boarding?

Having originally caught the attention of the media (and Airbus and Boeing) at the 2011 Paris Air Show when it announced it was working with COMAC on the design of the C919 aircraft, Ryanair again caught the industry's attention in 2012 when a senior executive revealed the carrier has asked COMAC to consider designing the C919 with wider doors to speed boarding.

"The Chinese are willing to listen to what we want," said Ryanair's chief financial officer, Howard Millar. "An aircraft manufactured by Boeing or Airbus is a one-size-fits-all. We want two people [to be able] to walk through the door. If the door is wider, you can load people on and off the aircraft quicker. We want a low-cost aircraft that suits our business model."

Detractors of the idea have questioned the engineering behind having wider doors, suggesting that the rest of the fuselage would have to be reinforced as a result, which would add weight and thus operating costs, which could cancel the financial benefits of faster turnaround times.

Of course, instead of wider doors, aircraft could just have more doors. Ryanair rival, easyJet, has indicated that it would like a third, central door in its narrow-body aircraft. Its 'ecoJet' scheme for an environmentally friendly short-haul aircraft features forward-swept laminar flow wings, partly for efficiency, but also because moving the wing root aft makes space for a mid-cabin passenger door. The airline says the centre door would accelerate boarding, even if just used on its own, because passengers would be able to head in either direction after entering, rather than forming a single queue in the aisle.

**HUMAN RACE** Moving outside the aircraft, human behaviour also slows the boarding process. All Nippon Airways spokeswoman Nao Gunji notes that general boarding passengers sometimes "mistakenly" try to board early. "As you can imagine, it requires delicate communication to inform them that they need to go back in the line and wait for their turn," she says.

Such delicate communication, of course, adds time to the process. Airlines, including All Nippon Airways, have started speeding the process with self-boarding, where passengers scan their own boarding passes, and pass through an automated gate into the jetway.

"Since it is fairly new, we don't have any data to share at the moment," Gunji explains, "but we are hoping it will be one of the solutions for faster, easier boarding."

**THINK OUTSIDE THE TUBE** You want a radical solution? "Preventing any hand luggage would help speed up the process," Berry adds. "But at the core of the airline experience is meant to be the passenger. As far as is possible, the airline wants to look after you within the limits they have – so they try and offer what they can –

04. Josh Jenkins from the Green River Ordinance band demonstrates how to really disrupt boarding
05. Some view Southwest's group boarding system as controlled chaos



PREVENTING ANY HAND LUGGAGE WOULD HELP SPEED UP THE PROCESS...



## a scientific approach

Astrophysicist Dr Jason Steffen from Chicago's Northwestern University and physics research institute Fermilab was frequently subjected to the vagaries of certain airline boarding procedures, and one day decided to apply his considerable scientific knowledge to the problem. One solution is a model that parallelises the boarding process rather than serialises it, meaning that as many people as possible can access the aisles to stow their luggage, allowing more people to simultaneously prepare to sit.

Dr Steffen has also devised a method to model free-for-all passenger boarding, with a potential assigned to each seat, based upon the seat preferences of the passengers. "Whenever a decision about where to sit needs to be made, a passenger (at some temperature that is a measure of their laidbackness) will make that decision using Boltzmann probabilities," he states on his blog. "Once they sit down, they don't move and the partition function is updated. I was pleased to see how well the decision-making model, airplane boarding model and the Monte Carlo [a computational algorithm] reproduced the expected Fermi-Dirac distribution of seating," he clarifies.

Just in case you were wondering about this point, Steffen notes, "Since the decision-making and passenger-boarding models ultimately result in a microcanonical ensemble of passenger states, the chemical potential is determined by the number of passengers and their energies, and not by a chemical potential of a passenger exchanging reservoir [as in the grand canonical ensemble]."

like letting you take hand luggage. If you want the current arrangement of cheap economy travel with your bag near you – then it comes at a cost: time."

Or perhaps airlines could eliminate all preferential boarding. Okay, that's not going to happen. As J Rene Villalobos, an Arizona State University professor who helped devise the reverse-pyramid method, told *The Chicago Tribune* in 2011, "Efficiency is trumped by their revenue-generating schemes."

The problem with many boarding concepts is that they would take up space and thus cost airlines money. For example, wider aisles mean fewer seats, and space for bags underneath seats takes away cargo area. "Maybe we should board like troops through a big open door," Berry suggests.

Airbus has patented a system by which passengers would board cabin modules that then would be loaded into the fuselage. In theory, this means that passengers can be seated in their respective seats over a relatively lengthy period, without costly immobilisation of the aircraft.

Similarly, École Polytechnique Fédérale de Lausanne touts its 'Clip-Air' system, where a flying wing would be loaded with modular cabins. For airports that use buses to access aircraft, designer Hannes Seeberg devised Skylift, a bus with modular cabins that lift up to the aircraft doors.

"However with such concepts, the sheer physical issue is that we are dealing with lots of people," Berry says. "They are all different, with different needs, and resist being automated or standardised, and will test systems to the limits. Such ideas only shift the problem somewhere



PEOPLE ARE ALL DIFFERENT,  
WITH DIFFERENT NEEDS, AND  
RESIST BEING AUTOMATED OR  
STANDARDISED, AND WILL TEST  
SYSTEMS TO THE LIMITS



else down the boarding chain – and rely on massive infrastructure and methodology changes with, possibly, little effect on the issue."

Practically speaking, there are limits to what we can expect, at least any time soon. "Aircraft have evolved to the shape and way they are," Berry notes, adding that new aircraft such as the A380 and A350, and B787 "are still airplanes with doors – even if the doors are a bit bigger".

He continues, "How big can the door be and still be structurally sound? How much would a radical new boarding method cost both in terms of aircraft development and airport infrastructure development? Look at the A380, an aircraft with two decks and a different door and boarding configuration. A seemingly small difference – but requiring radical adjustments to boarding practice and substantial new airport structures."

Many of the procedures we use date back to the Constellation airliners of the 1950s, Berry notes. "Any radical new idea – other than a modification to a current system – requires a push from an airline, an aircraft manufacturer, the relevant airport and the authorities. It would be a huge undertaking and would need everyone pushing in the same direction."

In other words, it might make more sense to focus our attention elsewhere. "The issue of boarding is just one part of the journey experience," Berry concludes. "The better we can make the whole – the smaller the relevance of the few minutes of getting onto the aircraft in the overall scheme of the journey." ☒





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# fresh approach

There is change in the air. As airlines introduce stunning new cabin designs, their rivals' product lifecycles can shorten in a bid to keep looking fresh for customers. However, shortened lifecycles must be planned for, and not become a reactive process

MARISA GARCIA



That new aircraft feel is addictive. After lean years of static utilitarianism maintained well past its relevance, the aircraft cabin is bursting with fashion.

Unprecedented volumes of new aircraft orders, new materials and components, improvements to IFE, the introduction of connectivity, rising passenger expectations and increased competition have created a fertile environment for new aircraft interiors programmes, generating pressure to keep those new cabins current.

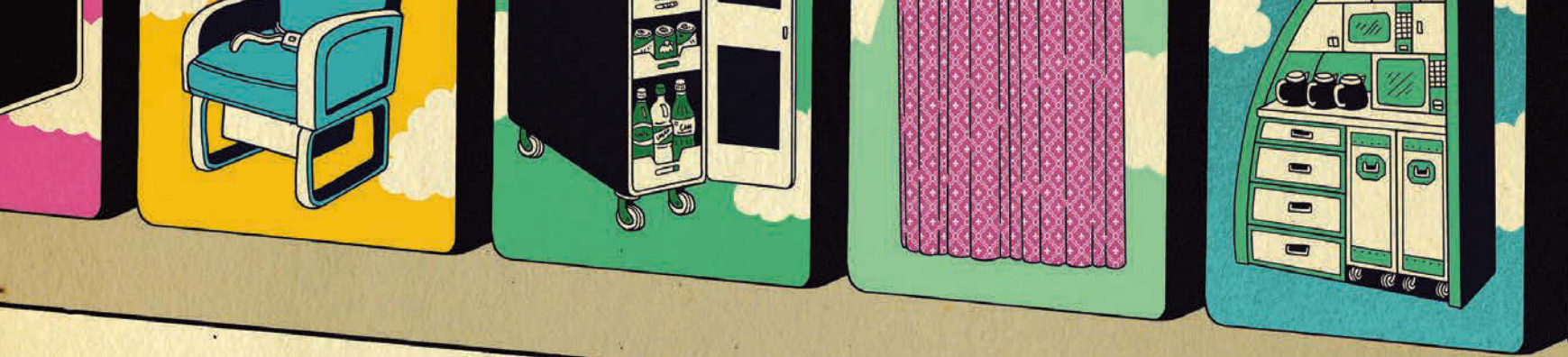
Brand and product managers at airlines around the world are capitalising on new market conditions to change their interiors, and they want to keep the changes coming.

“The days of ‘just put in anything and people will fly as long as it’s cheap’ are over,” says Daniel Baron, owner and managing director of LIFT Strategic Design, based in Tokyo. He suggests airlines “always try to stay fresh looking, even if there is no budget for huge investments in new seat hardware. Even if improvements are incremental, the message to the customer will be positive.”

He’s not alone. The six leading design firms we spoke to all agreed that airlines need to differentiate their product to compete, and to have a lifecycle strategy in place to ensure that differentiation continues.

**THE CORRECT APPROACH** Jaime Moreno, CEO, and Juliane Trummer, director of insights and strategy, at





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- 01. Tried and tested: British Airways has introduced only subtle changes to its Club World on its new A380 and B787 fleet
- 02. Brand panels present a simple way to update part of the cabin

Cushions, brand panels and even IFE interfaces can all be regularly updated for a fresh look at a modest cost

Mormedi, based in Madrid, suggest airlines should “think long term about what is right for them rather than getting into a reactive dynamic”. He adds, “It is important to create upgradeable solutions, consisting of a basic platform that remains basically the same, but can be upgraded with plug-and-play components.”

Cabin design should be approached not as an objective itself, says Ben Orson, managing director at JPA Design in London, “But through fleet lifecycles, competition, customer expectations and technology.”

“The past 10 years has seen a lot of change in the business class arena,” adds Tim Manson, JPA’s design director, “as more airlines make the quantum upgrade to full-flat and direct aisle access seats.” These opportunities extend throughout the aircraft as “improved business class products have placed significant pressure on first class. This has led to airlines engaging in more first class upgrades and refresh programmes, which in turn drives shorter lifecycles to maintain differentiation and market prominence.” Manson emphasises that successful airlines have “solid track records on all classes”.

Seattle-based agency Teague encourages airlines to be bold, to take risks, and to avoid the “long road to middle”. Devin Liddell, principal brand strategist; Sarah Matheny, brand director; and Christopher Pirie, director of business



## CABIN DESIGN SHOULD BE APPROACHED NOT AS AN OBJECTIVE ITSELF



development at the agency, believe that brand managers at airlines should take leadership and be free to choose distinctive (even exaggerated) characteristics of colour and structure to create a unique experience for the passenger.

Rather than investing vast resources in a fleet-wide cabin overhaul with a ‘Phoenixing strategy’, rising from the ashes to reinvent themselves every decade, they recommend airlines have a cabin interior design plan that reflects a “cogent sense of brand”.

Proactive interiors programmes may include components that last up to 10 years in service, but with a scheduled renovation every three years of key elements instead of the entire cabin. In more conservative design styles, with classic tailoring, this renovation can even take place every five years. The key, says Teague, is to schedule long refreshers of fundamental components, and frequent refreshers of light elements on top. They suggest that with proactive planning, airlines can develop light seasonal configurations for aircraft, giving passengers something new and surprising to find on board throughout the year.



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03

Nigel Goode, director of Priestmangoode in London, expects that key airlines will drive change and accelerate the demand for brand refreshment over the next decade. As he points out, “It’s about more than just seats, it’s about the cabin.” Changes to elements such as carpets, curtains, bulkheads and other elements, which are easy to update without massive structural changes, are a smart idea to keep the aircraft cabin design updated. He says airlines need to plan from day one what their cabin interiors process will be. “The new model may last five to seven years, but changes to that model keep it fresh.” Goode discourages a ‘stop-start’ approach to cabin design, instead recommending that it should be a smooth and continuous process, with airlines planning mid-cycle new features in advance.

Peter Knapp, global creative officer at Landor Associates, London, feels we’ve just begun to capitalise on potential improvements to cabin interiors. Aviation, he suggests, has “an internal obsession” with the seat. He sees many lost opportunities for innovation in other cabin elements that affect the design aesthetic and have great impact to the passenger experience. He describes the “MASH” aesthetic of galleys and trolleys as incongruous with an advanced cabin design. The consideration given to the design of these structural and service elements needs to be greater, so they too contribute to the distinctive design of the cabin.



## AIRLINES NEED TO PLAN FROM DAY ONE WHAT THEIR CABIN PROCESS WILL BE



Knapp points to elements of the passenger experience on board which can be updated often and do not require a cabin redesign: “IFE content can change with higher frequency” and airlines could use “more imagination in catering”. Knapp believes that “onboard retailing is very undervalued and presents an opportunity if imaginatively used”. He questions the current model of onboard retailing, often limited to identical products found in all inflight magazines and delivered to the seat in those same service trolleys that need a redesign. With some imagination, Knapp suggests, airlines can provide a wider selection of products unique to the carrier, and change the method of orders and deliveries, with positive effect.

“Airlines need to be open-minded to trends outside the industry,” he suggests. The aviation industry as a whole needs to encourage innovation with a more “defined sense of style aesthetic” coherent to the global marketplace.

**UNIQUE TOUCHES** The drive to change aircraft interior design strategies and decrease the design lifecycle puts certain industry trends at direct odds with the objectives of designers and airlines.

03. Singapore Airlines ties in IFE upgrades with new aircraft deliveries or regular retrofit programmes



04. Recaro designs seats such as the PL3510 so they can be easily updated during their service life



04



OEMs SHOULD RECONCILE THE PRODUCTS APPROVED ON INDIVIDUAL MODELS

As Chew Tai Lu, VP of product innovation at Singapore Airlines, tells us, “The trend towards catalogue seats such as economy class products is not in the best interest of customers, or of airlines who seek product differentiation.”

Baron from LIFT adds that, “More suppliers are needed to allow greater design customisation while ensuring timely development of interior components, and more human resources are needed at regulatory authorities to speed up the certification process.”

“For the aircraft industry it is naturally more difficult to provide sophisticated design solutions and detailing due to cost and certification restrictions,” according to the Mormedi team. “This gap becomes very visible when one compares the interior of an aircraft with the interior of a modern car, for example. On aircraft, one still sees a lot of crude detailing in the seats, lavatories, monuments and the overall architecture, although the OEMs have made huge advancements in this regard.”

Nigel Goode suggests that OEMs should facilitate change by reconciling the products approved on individual models of aircraft, making them universally available, thereby allowing airlines with varying aircraft

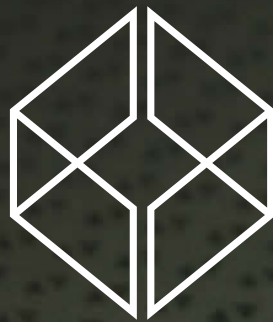
types to introduce design elements to cabin interiors throughout their fleet without needing to undergo separate certification processes with the same OEM.

Carrying out change may be simplified in coming years, say JPA, with innovative and forward-thinking suppliers creating products with elements that can be easily “swapped out”, eliminating the need for a major equipment change.

**THE SUPPLIER VIEW** Component manufacturers are getting the message, although they seem to be walking on a very fine line between meeting the needs of OEMs for products that can meet certification requirements and tight deadlines, and the needs of designers and airlines to revolutionise cabin design and introduce unique products. From speaking to several manufacturers, it seems they are positioning themselves with care, to avoid tipping over.

Cameron Allan, commercial director at Acro Aircraft Seating, UK, says the objectives of airlines are for cabin design that ensures a balance between airline profitability and a pleasant passenger experience. He says the principal strategy for his customers is to refresh interiors by improving comfort and durability, and the selling factor is the fuel savings achieved by lighter-weight interiors. He sees a high demand for customised product from customers, telling us that Acro’s airline customers do not want an out-of-the-box solution.





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Recaro views quality and durability as its prime market differentiator, with seats designed to stay in service up to 30 years, but the company recognises that airlines want to change the appearance of their cabins and innovate their designs in cycles of six to eight years. René Dankwerth, VP of R&D at Recaro Aircraft Seating, Germany, told us the company is positioning itself to accommodate this shorter lifecycle by designing seats that can be updated throughout their service life to match the airline's new cabin design objectives.

Laurent Stritter, VP of marketing and product strategy at Zodiac Aerospace, emphasises that cabin interior lifecycles relate to airline segmentation. Short-haul, regional and low-cost airlines may continue to prefer extended interiors lifecycles based on affordable, reliable and durable components.

At the other end of the spectrum, he sees world-class airlines basing their brand on providing an exceptional passenger experience, and increasing competition by redesigning and refreshing their cabins at shorter intervals.

'Traditional' airlines, he tells us, will follow the lead of these world-class carriers. The cycle of their cabin interiors will keep up with the changes those world-class carriers make.

In the past decade, one model of seat was intended to fit the needs of all airlines, he says, but products now need to be tailored to the needs of the specific airline's segmentation. The result is a need to accommodate a high degree of design customisation.

Zodiac's design team have developed a 'mid-life upgrade' product, allowing airlines, as an example, to select major components that will be in service for a

## future vision



**Sarah Matheny, brand director, Teague:** "Teague sees airline brands developing beyond the journey, with collaboration between airlines, hotels and other travel service providers working together to extend the brand narrative into a truly seamless journey for the passenger."



**Nigel Goode, director, Priestmangoode:** "I foresee a brand experience all along the journey to and from the gate, ensuring a smooth transition for the passenger. With stress levels associated with travel rising, the more airlines can do to link things together, the better. All the elements must come together seamlessly, from website and billboard to home."



**Tim Manson, design director, JPA design:** "Future generations of cabins and seats should be smart spaces, capable of analysing and predicting our every move, mood and preference. Loaded with sensors and algorithms, seats and cabins will work together, streaming rich data to provide invaluable information, enabling more imaginative solutions, and creative experiences that will be tailored to individuals or groups needs to be more seamless, less stressful, and more enjoyable."



**Jaime Moreno, CEO, Mormedi:** "As the competition gets fiercer, airlines will have to think about the complete passenger experience and far beyond just on board. A user-centric design approach, considering the product as much as the service level, will be key in creating a relevant offering for the future."



**Daniel Baron, owner, LIFT Strategic Design:** "Passenger size will influence future cabin design trends. As travellers get taller and wider, and as demand for air travel rises, more people will be squeezed into shrinking economy class seats. More attention needs to be paid to enhancing comfort in this segment."



**Peter Knapp, global creative officer, Landor Associates:** "More and more people feel air travel is their right. That won't go away. For the young generation, flying is the same as getting on the bus. Airlines have great opportunities for differentiation by addressing the needs of other demographics."



WORLD-CLASS AIRLINES WILL INCREASE COMPETITION BY REDESIGNING AND REFRESHING AT SHORTER INTERVALS



05. Iberia can quickly and inexpensively transform its latest A330 cabins by swapping soft elements



SHORTENING CABIN LIFECYCLES ALONE  
CANNOT DRIVE CUSTOMER LOYALTY

lifecycle of eight years, with a pre-planned aesthetic change at the five-year interval.

It's reasonable to question the sustainability of this shorter lifecycle trend. We've seen shopping frenzies and, as Teague put it, 'Phoenixing strategies', come and go. Market forces and utterly unforeseeable events have abruptly halted drives for innovation before and there is no reason to think they won't do so again. But those we spoke to feel there is something different in the air this time around. Aggressive competition and increased customer expectations may perpetuate this trend and make it invulnerable to global economic conditions.

**THE AIRLINE BRAND IS CHANGING** Where airline brands once represented a national identity and later a corporate identity, leading design trend analysts, such as Peter Knapp at Landor Associates, suggest those brand models are becoming irrelevant. Knapp predicts that a customer-centric brand identity will prove most successful. The airline brand should focus its corporate identity at the consumer profile of its target customers.

Knapp feels that significant changes to the dynamics of growth and differentiation are already under way. He says

the evolution of low-cost carriers, their ascension into brands differentiated by product offering with increasing quality, and their efforts to breach the long-haul/short-haul divide, will prompt a shift in strategy for the industry. The industry will move beyond the flag carrier versus low-cost carrier brand models, to strong airline brands directed at the diverse sectors of the travel market.

The airline industry, Knapp suggests, should "look beyond the sector and understand trends in the digital realm" to guide their activities, providing passengers with the ability to "tailor their own experience".

Designers share a future vision that is not dependent on the aircraft cabin, nor even the aircraft, but on the strength and relevance of the airline's brand as a harmonised organic element of the greater ethos of travel.

The design experts we spoke to had a major caveat: all this effort may not be enough. Shortening cabin lifecycles alone cannot drive customer loyalty to a particular airline brand. The words 'holistic' and 'seamless' dominated the conversations we had with the experts, reflecting a unanimous agreement that the true enhancement of the passenger experience will depend on all stages of the journey. ☒





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# bags of opportunity

Bag2Go aims to reinvent the travel experience, giving passengers the option to fly without their bags, and airlines the opportunity to raise revenues and improve the onboard experience

ANTHONY JAMES



The clean lines of the cabin you see in these pages have been created by a simple trick – the overhead bins have been removed. In a stroke this single-aisle jetliner exudes a light and airy feel, with projection technology displaying a mix of eye-pleasing graphics, relaxing scenes, useful information, and inevitably the odd sponsor's message on the compartment-free sidewalls.

“Baggage is bad for the cabin,” believes Jan Reh, innovation manager, Emerging Technologies & Concepts, Airbus, with a brief to explore disruptive ideas that could result in a real game changer for the aviation industry. He adds, “The cabin should be for the people – to

accommodate the passenger to get from A to B – not to stow baggage! Today's aircraft interior architecture is wrong. It doesn't work anymore because you have more seats, less space and less ability to stow all the baggage.”

An ex-Lufthansa Technik design engineer, Reh was once responsible for developing an Airbus Corporate Jet interior scheme (Project U) with a similar use of projection technology on the sidewalls – and not a luggage rack in sight, as would befit a VIP jet designed to carry just a handful of passengers in ultimate luxury.

Perhaps he needs reminding that his current employer is in the business of selling commercial aircraft, which, if



01

“  
BAG2GO HAS A ROLE IN REKINDLING  
PASSENGERS’ LOVE AFFAIR WITH TRAVEL”

- 01. The cabin has a much lighter feeling without the overhead bins – and is lighter in weight
- 02. Carry-on items can just be a small case and a mobile phone

its customers are successful, are more often than not full to bursting with passengers trying to squeeze their luggage and travel paraphernalia into every last inch of bin space.

“Actually we do not produce aircraft,” he counters. “We sell mobility. What we need to deliver is the most efficient mobility device, as well as any necessary accessories to make it even more efficient. The future belongs to value propositions based on innovation and cooperation, to continuously improve the aviation ecosystem that everyone is part of – guaranteeing mobility for airline customers and operators to let them move people and baggage in the most comfortable and efficient way.”

Hence Reh and his team have not just hit the delete button to remove the overhead bins – as seen in the renderings here – they are actually attempting to invent a completely new approach to baggage, dubbed Bag2Go, which aims to reset our relationship with luggage.

“As air traffic is forecast to double by 2030, Bag2Go is designed and envisioned to interlink aircraft, infrastructures, people and their baggage to ensure smooth aircraft operation, allowing vital growth of the industry and enabling future aircraft concepts to take-off,” continues Reh.

**LIGHTEN THE LOAD** Working with suitcase manufacturer Rimowa and technology partner

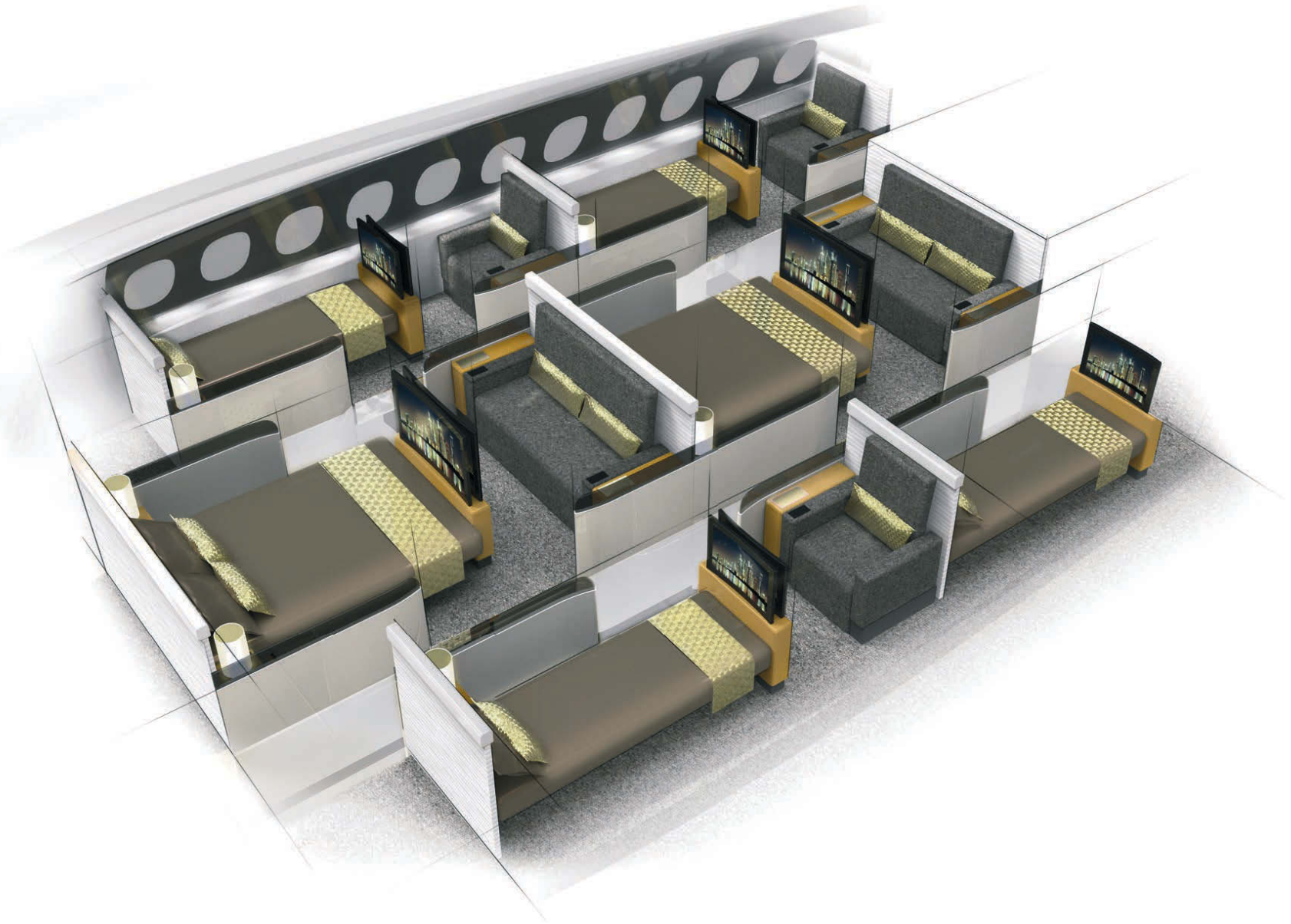
T-Systems, Bag2Go is essentially a digitally enabled suitcase that passengers can control via a mobile app. The bag communicates with airport check-in and security and is fully traceable, enabling self-travelling transport services – and potentially unlocking the baggage-free cabin vision.

“If we want to offer the most efficient mobility device, we need to think beyond the aircraft itself,” says Reh. “We thought about how we can optimise the flow of passengers and realised that passengers are actually people and baggage. These are the two components that Airbus needs to concentrate on because this is the driver for any aircraft development. It’s these two things combined that drive the cargo and passenger space, as well as the baggage rules – because if you only had the people with no baggage you could build the most fantastic aircraft. No bins, sky roof views, super light in weight with reduced fuel consumption and fewer emissions.”

Reh estimates that removing the overhead bins and related infrastructure from an A320 could reduce weight by more than 1 tonne. “When you know that 1kg less in an aircraft in a year is 30 tonnes less fuel, then you can do some interesting calculations,” he says. “Electrical flight is a great option for the future, but to realise it you need to radically reduce the weight of today’s aircraft.”

**ROMANTIC MOTION** Bag2Go also has an important role to play in rekindling passengers’ love affair with air travel: “Baggage keeps you away from a great experience. We have developed the first intelligent suitcase because it takes away all those worries – not only the physical inconvenience of handling it yourself, but also the worries of losing it and all the other issues that come with baggage.” (See *Always read the label* (page 77) for features of the Bag2Go suitcase.)





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03

## always read the label

“A suitcase you can always locate, that travels independently and helps you pack,” this is how Airbus describes Bag2Go, which it has developed with suitcase manufacturer Rimowa and technology partner T-Systems. Fitted with a 2G mobile radio and software module, a display (using e-ink that remains visible should the battery fail), and electronic scales, the bag can weigh itself, communicate with an airport’s check-in and security, and is fully traceable.

Passengers enter the details of their flight into an app, which transmits the information to the airline. The airline in turn generates a barcode, which appears on the display. The barcode contains information such as the weight of the suitcase and who its owner is, along with all the flight details. As such, the suitcase can travel independently of its owner (if the service is available), right to the destination, even if flights are changed at short notice or a connecting flight is missed. Bag2Go also registers whether a suitcase was opened during its journey and informs the owner when and where this occurred.

“Baggage tracking in the past has mainly been done using RFID,” explains Airbus’s Jan Reh. “The problem with this is that large investments are needed in the airport for it to work. Our goal was to bring something to the market that uses technology we already have in place. The Bag2Go has built-in 2G technology, which enables it to be used straight away.”

The ultimate goal is to get as much baggage as possible off the aircraft, or at least out of the cabin, with the majority delivered via a trusted logistics partner and ready and waiting at the final destination – the hotel, rather than the airport. “Most hotels have a shuttle running to and from the airport every day, so they can easily collect baggage as it arrives and that could be a service they offer to build customer loyalty,” explains Reh, who also suggests airport taxis as another means of transferring bags to final destinations. “There are lots of cabs and taxis that have no jobs at specific times of the day – an app could help taxi drivers see all the bags that need transporting.”

Some passengers will always want to take their bag with them inside the cabin on their flight. Hence Reh has designed the dimensions of Bag2Go to ensure it can still be stored under the seat in front. “You have the choice – you can store it underneath the seat in front or if you want to have more space for your feet, you track and trace your bag via e-logistics and just travel with a few essential items in a much smaller bag.”

If the concept is successful, it could ultimately act as the catalyst for a standardised suitcase size, enabling far more efficient baggage handling. “The industry would love to optimise the logistics of loading,” says Reh. “It’s amazing that so much luggage is still loaded individually by hand. We need to rethink this – imagine an off-site logistics warehouse where the bags are collected in advance of the flight [from passengers’ homes or hotels] and scanned for security before being loaded into a cabin-optimised



04

- 03. All packed: The suitcase can be picked up from home, leaving you with just a small travel bag
- 04. Bag, device and aircraft all connect to create the Bag2Go concept

container, which is then sealed and driven to the airport, directly to the aircraft, where the driver opens the door and loads the container himself because the lorry has a loading function. Suddenly you do not need any infrastructure at the airport. It is more efficient and you can save a lot of money, but is only possible with a bag like that.”

Airports struggling to expand take note – such an approach could liberate vast swathes of existing infrastructure and resources currently given over to baggage handling for alternative use, perhaps making room for an extra satellite or two.

*"The cabin is the living space in the air. Everything has to work for you. You need to be able to work, to meet, to converse, to dine, to relax and to sleep. To achieve this, the cabin environment must be completely controllable – and this is impossible without the power to control light – especially natural light."*

Mauricio Cabal, President, Mauricio Cabal Design



**STRUCTURAL CHANGE** For cabin designers and engineers, the absence of luggage racks is an exciting prospect. First there is the weight saving that Reh has already mentioned. “For the A380, we could get over 5 tonnes out of the aircraft by removing the overhead lockers, and for the A330 it’s around 3 tonnes,” he notes – and that’s just the structural weight saving of removing the actual bins and their attachments. However, Reh says the positive effects of Bag2Go would have the greatest impact on the short-haul sector, where cabin baggage issues are most acute.

Removing the bins will also provide airlines with a blank canvas that Reh describes as a “new revenue space” for the delivery of visual information and advertising. “Today a hat rack is lost revenue space,” he says. “Currently you need the space for bags but in the future it will be where you interact and connect with the outside world. Airlines could promote destinations and products. Information about the environment and journey could be displayed to help create a better travel experience.”

A projection system would be integrated into the cabin, with three areas of the cabin lining available for branding opportunities. “Airlines could have different branding on every flight, for special occasions, for different seasons, routes – anything is possible with this multimedia concept,” enthuses Reh. “You can create all sorts of moods to grab the emotions of passengers. You can have moments in the flight where it can change – from information about altitude, etc, to actually displaying the items the passenger has selected from the duty-free catalogue and inflight menu, using an app, to improve the crew service so that they no longer have to shout across to ask what it is you want.” (See *Digital transformation*, page 82.)

Reh sees digital interaction between the passengers and the onboard systems as key to unlocking the concept’s

## loyalty scheme

Rimowa bags aren’t the cheapest, and Airbus’s Jan Reh estimates that Bag2Go could cost 20% more than a standard suitcase when it first goes on sale. However, frequent fliers could be given the bag for free as a customer retention tool offered by airlines, hotel chains or credit card companies. “If you pay for a lot of flights with your credit card, and pay for hotels, meals and other purchases when travelling, then the bag will be free as essentially it has been refinanced via your transactions,” explains Reh. “And for people who travel only once a year or for families, we are already thinking about business models and ideas around rental programmes. Looking to the future, I can really see a new opportunity for luggage manufacturers to offer bag fleet management services.”

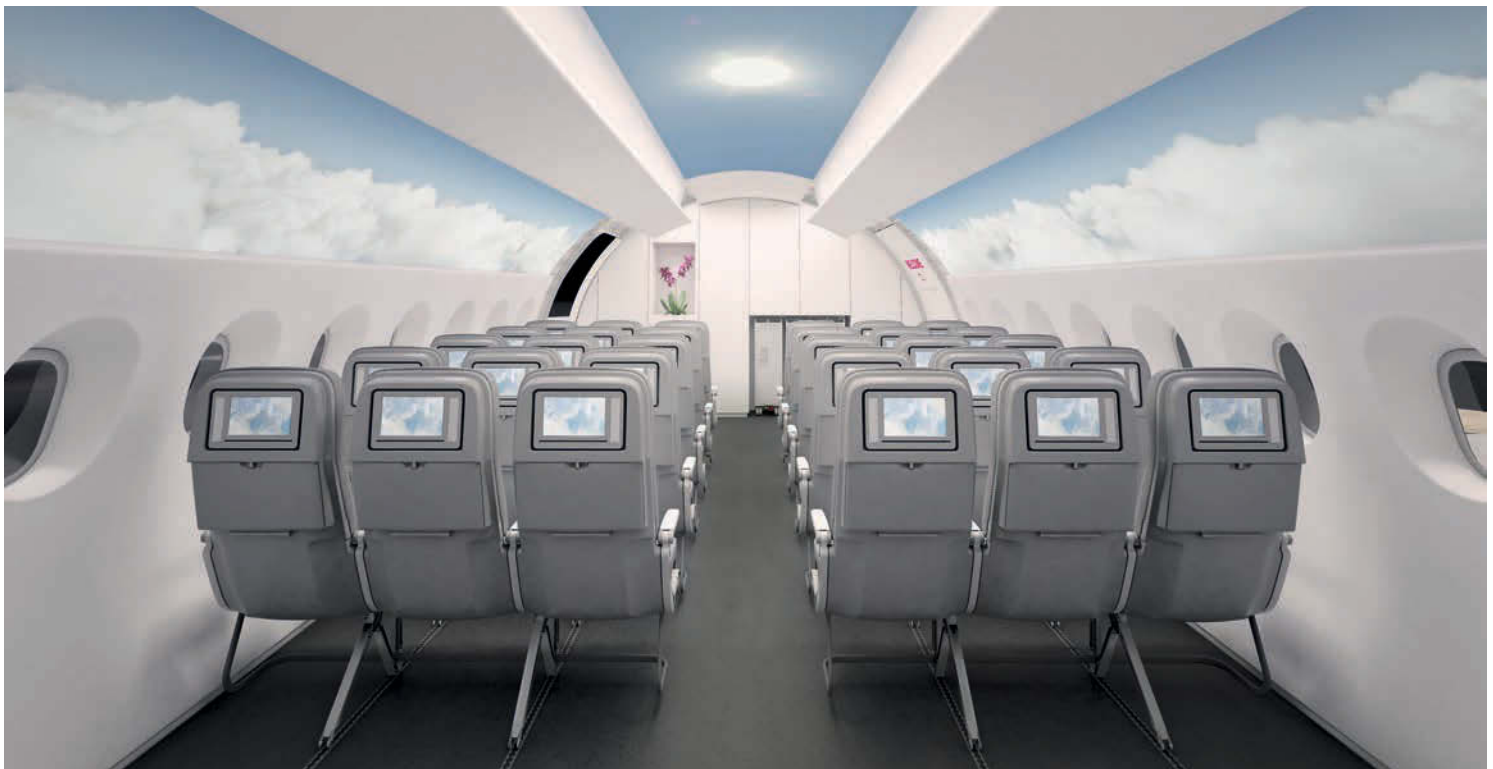


## THE A380 COULD BE OVER 5 TONNES LIGHTER WITHOUT OVERHEAD LOCKERS



true potential. “For example, you could have crowd-buying, where if 50% of the passengers buy a particular item from the duty-free catalogue, they get a discount. Overall the space is for interactive infotainment – it’s not for movies but for a new way of multimedia interaction. We need to transform from a classical aircraft builder and dive deeper into the needs of digitally aware airlines and passengers to develop appropriate solutions – this change is not reversible.”

05. Blue sky thinking. Without overhead bins, the cabin space is open for new opportunities





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06

- 06. Aisles could potentially be narrower, if roll-on cases are not being taken on board
- 07. From practical travel information to marketing, the overhead space is a blank canvas for operators

A simple projection system is preferred as it avoids many of the certification and weight headaches presented by attempting to integrate digital screens into the sidewalls. Reh also says it would work better with the cabin lining, requiring less work to protect against unsightly gaps between components. Airbus is already working on a prototype projection system for the A350.

Another important benefit of reducing the flow of baggage into the cabin will be an improvement in boarding and turnaround times, as passengers will no longer have to wait in the aisle for their fellow travellers to stuff their bags into already overfilled compartments, or retrieve them upon landing. Reh says the goal is to reduce turnaround times from 40 to 20 minutes in the short-haul sector. Cabin crew will also benefit from no longer having to help passengers load and unload cases into overhead lockers.

**AMICABLE SEPARATION** Ultimately, Reh can foresee a potential future where passengers and bags travel separately – a vision likely to be welcomed by those responsible for aviation security. This could lead to more relaxed screening procedures, improving efficiency, especially as the Bag2Go suitcase will have the ability to report any unauthorised tampering during its journey to both passenger and airline.

“One scenario is to have logistics via freighter aircraft with simpler security procedures that only bring the luggage and cargo – say one A380 per day – and you would have commuter aircraft that transport only the passenger, the most valuable payload of all,” he says. However, Reh admits the airlines would probably need to transport commercial cargo along with the baggage, as just transporting suitcases is unlikely to be profitable.

Extrapolating this notion even further, one could envisage a new generation of double-deck, single-aisle aircraft dedicated to passenger transport only – however, Reh warns that such scenarios hinge on a new approach to baggage. “This could be the enabler to make such concepts fly,” he says. “If we really want to develop true commuter



07

aircraft, then we need to develop new systems where passengers are able to take hand baggage, but if they need bigger bags, they will use an alternative logistics solution to arrange this, rather than fly with the actual bag in the cabin. Otherwise, do we expect baggage bins to grow and grow? Shall we have bubbles outside the fuselage to accommodate more bags? I think we have reached the limit – we cannot grow further. We have to rethink this and go in the other direction – get VIP back!”

**CURRENT STATUS** For now, Reh is working on realising a potential A320 retrofit or line-fit option with the proposed cabin scheme. “If we have a customer who is interested, we can deliver this – the technology is there,” he says.

The luggage bins on conventional aircraft currently house the PSUs, however Reh does not see this as a problem, pointing out that the ACJ is available with a bin-free cabin lining option that still includes PSUs, while oxygen masks and reading lights could also be integrated into seating, if necessary.

Reh is also keen to emphasise that airlines will always have a choice: “The new cabin we envisage can be a combination of bins and no bins,” he says. “Airlines could

## digital transformation

Enabling your trolley to digitally interact with its environment during the journey is just one interesting example of a trend that can be seen in various industries, says Fabian Zwirn of Airbus's Emerging Technologies & Concepts innovation cell. "Everyday items and services gain in value by integrating them into clever networks and new business models," he continues. "Bag2Go is a good example of how passengers can utilise digital services and new products to enhance their journey. Starting from here, we can envision a whole new ecosystem of services that are enabled by connected devices, including the aircraft itself. By making the aircraft and its cabin an integral part of a communication network, we can create a platform for a new generation of cabin services and provide levers to improve the current business. We will see a lot of changes in our industry over the next years. Existing processes will evolve under the pressure of digital innovations and impact the way we travel and interact with the aircraft cabin. We now have the opportunity to find more positive examples of how the digital transformation can enrich the way we travel tomorrow."

### 08. Aircraft and cabin become an integral part of a communication network

offer a luggage rack to those passengers willing to pay for it, for example, such as musicians with instruments, and you'd need bins by the emergency exits anyway as you cannot store items underneath the seat in front."

This could create a new cabin architecture, where sections with bins flow seamlessly into sections without. "If we can get just 30% of passengers to use Bag2Go, and just part of the cabin free from bins and with projection technology, that will become the 'cool' part of the cabin and will prompt more passengers to take up Bag2Go."

Perhaps this is the most ingenious aspect of the scheme – instead of attempting to force change from above via new rules or regulations, Reh is relying on organic growth driven by the popularity of the bag itself. "We need to be independent – we need to start with a product that works without the cooperation of anyone," he says. "This is a critical success factor – if we need someone else in the value chain to work with, it could be fatal because they may not have the money or time or share the vision."

Hence the bag in its first iteration has to be desirable in its own right, designed by a recognised brand, with full track-and-trace functionality and the ability to weigh itself. The next stage, and currently the biggest hurdle, is how to ensure full compatibility between Bag2Go and the 10 or so different software systems that airlines currently use to generate bag tag data codes. Fortunately, Reh says he is working with an interested airline and has also found a potential software partner that may be able to help solve this particular problem.

Meanwhile, Airbus will present Bag2Go at the CeBIT show in Hanover, with a full cabin section mock-up included to get across the potential of the project. An airline passenger trial will start straight after, involving "hundreds of bags". The ambition is to have an actual Bag2Go suitcase on the market by 2015. There's a long way to go, of course, but it's easy to agree with Reh that today's approach to baggage is unsustainable – any attempt to improve the situation should be commended. ☒





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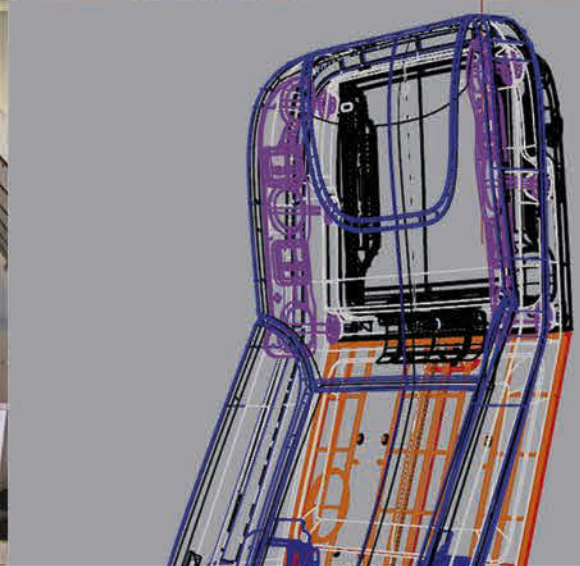
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# adapt **and** survive

A major disaster with low loss of life – Asiana 214 offers lessons in what went right and what went wrong inside the passenger cabin

CHRISTINE NEGRONI





01. The wreckage was sectioned before being moved to a secure storage facility



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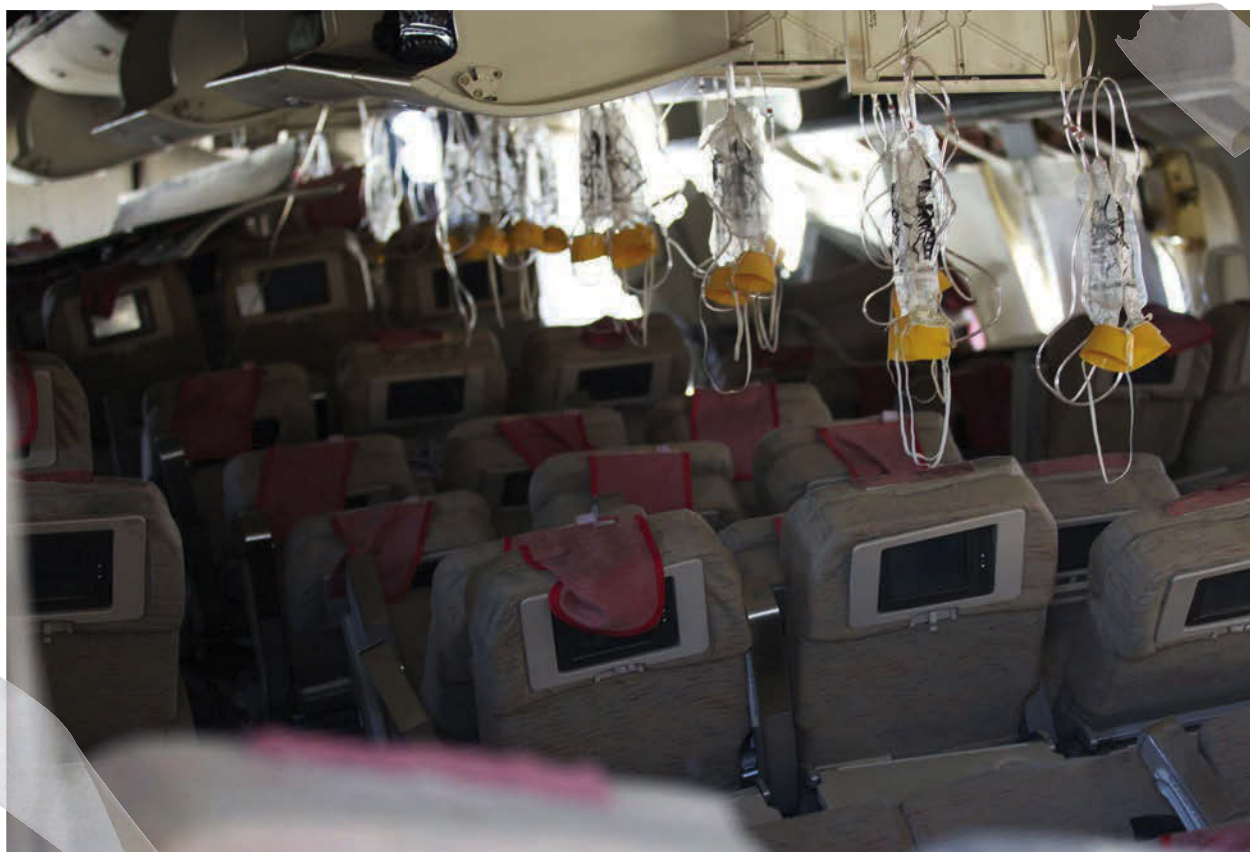
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02



In the chaos of the crash landing and emergency evacuation of Asiana 214 at San Francisco International Airport on 6 July 2013, 186 people were hurt and two died from injuries sustained in the accident. (A law suit is pending over whether a third traveller, who was run over by first responders at the site, was dead already or whether she was killed by the fire truck.) But a remarkable 106 people were physically unharmed. From the sight of the wreckage – a blackened hulk missing its decoupled tail section and a spray of debris – that may have seemed a miracle to many. But this accident is the latest example of how past air disasters have created safer cabin interiors that are helping to save lives now.

The nine-year-old Boeing 777 on approach to runway 28L was flying at over 100kts when the main landing gear struck the sea wall just before the runway. The rear fuselage separated and the rest of the aircraft continued on – becoming airborne briefly as it rotated 330°. Then the belly of the aircraft slammed onto the ground. Cabin structures including seats, overhead bins, galleys and lavatories experienced *g*-forces in excess of that for which they were designed and in some cases the structures failed, but still offered protection to the occupants in the cabin and cockpit.

“This aircraft did exactly what designers want it to do. In the case of a survivable hard landing, the fuselage and the seating systems worked together to absorb the impact energy,” says Robert Salzar, principal scientist at the Center for Applied Biomechanics at the University of Virginia.



## THIS AIRCRAFT DID EXACTLY WHAT DESIGNERS WANT IT TO DO

Practically everything that goes into an airliner cabin is analysed to see how it will interact with occupants in an impact situation. These include the seats, the seat-to-floor attachments and the seat restraints, the overhead bins and side panels. Other components must help provide rapid escape. Those would be the evacuation slides, doors and emergency exit windows, floor lighting and the materials that will slow the spread of smoke and fire.

When Dan Freeman, director of payloads engineering for Boeing, was asked what components inside the cabin had to be certified for safety, he said “everything”.

In a presentation on 11 December 2013 at the National Transportation Safety Board’s (NTSB) hearing into the crash, Boeing’s evacuation systems engineer, Bruce Wallace, told investigators, despite “multiple severe impacts” the passenger seats and belts provided protection, while the cabin structure maintained enough integrity that the “overhead stow bins did not fall on the passengers or impede evacuation”.

When Asiana 214 finally came to a stop, senior flight attendant, Tae Sik Yoo saw the fire outside the second door on the right side of the aircraft. He ordered an evacuation

02. Evidence indicates that not every passenger was properly restrained



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03



THE 777'S PERFORMANCE HIGHLIGHTS THE BENEFITS OF THE AVIATION INDUSTRY'S WORK TO INCREASE SURVIVABILITY



even before the cockpit crew and flight services manager realised the danger.

"I thought to myself, the crew does not know what is happening in the rear of the aircraft," Yoo wrote in his statement to the investigators. According to his report, he made two emergency announcements and started the evacuation. This was not without problems, though. At two doors on the right side of the cabin, the evacuation slides had inflated during the second impact, trapping the two flight attendants whose jump seats were near those doors and making those escape routes inoperable.

Passengers and crew fled through the remaining five doors and from the hole in the back where the tail had been. While many people got off quickly, some debilitated passengers remained inside where smoke was beginning to fill the cabin.

Still, as Boeing's Wallace pointed out at the hearing, "Smoke or fire did not prevent complete evacuation of the aeroplane." The way the B777 performed "highlights the benefits of the aviation industry's work to increase aeroplane safety and survivability", Wallace concluded.

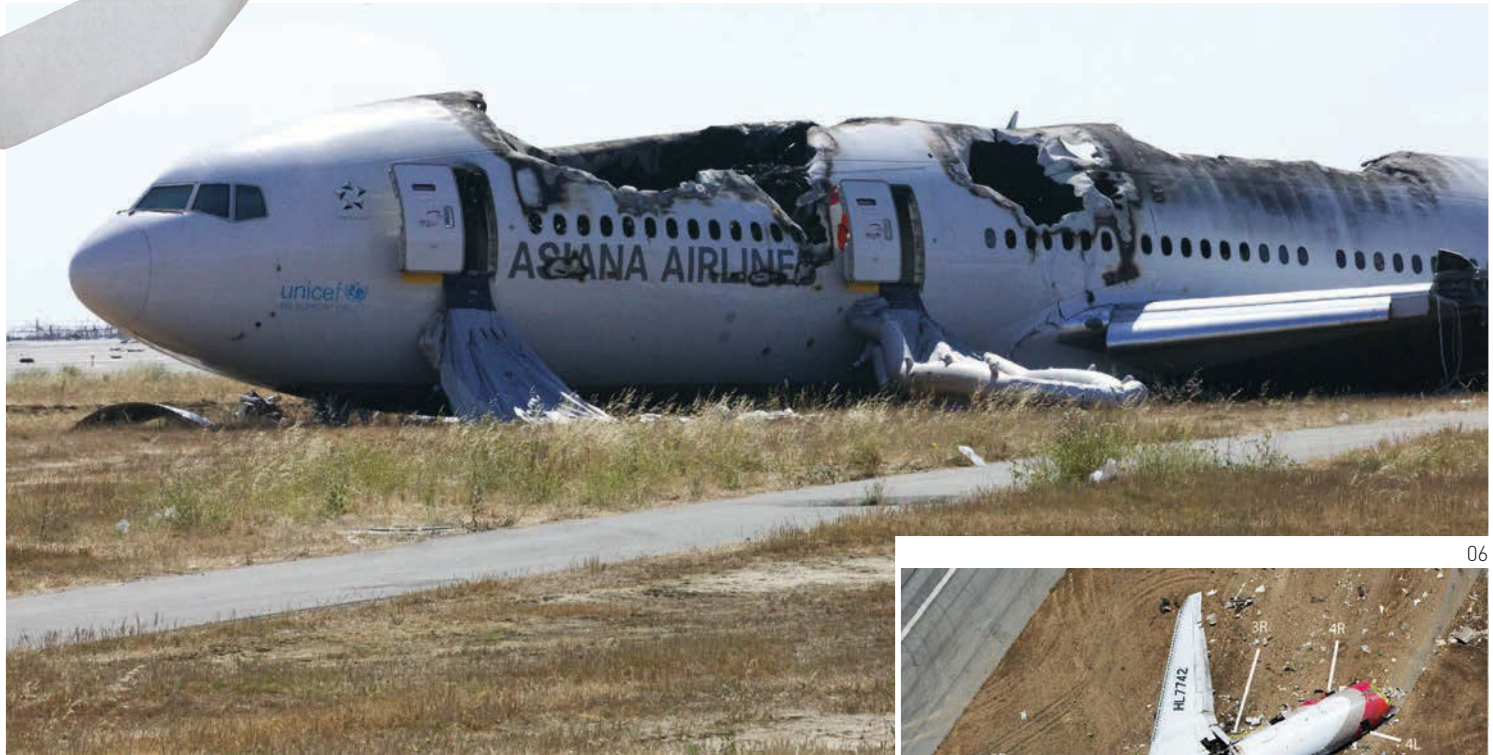
- 03. Two of the emergency slides did not operate properly
- 04. Amazingly, rather than get out ASAP, many passengers collected their baggage before evacuating

04



## a duty to care

**Asiana has become the first airline to be fined by the US DOT for failing to adhere to the 'family assistance plan' as stipulated by the Foreign Air Carrier Support Act of 1997. The plan in question provides that, in the event of a foreign aircraft having an accident in the USA which results in a major loss of life, the carrier must, among other requirements, publicise and staff a reliable, toll-free telephone number to take calls from families of passengers involved in the accident; notify the families of passengers involved as soon as practicable after the carrier has verified passengers' identities; and commit sufficient resources to carry out the family assistance plan. On the day following the crash, Asiana failed to widely publicise the relevant telephone number, so family members had to go through Asiana's toll-free reservations line and its automated menus. In addition, Asiana took two full days to successfully contact the families of 75% of passengers, while some were not contacted for five days. The US DOT deemed that the airline had not committed sufficient funds to the family plan, and imposed a fine of US\$500,000.**



05



THE PASSENGER SHOULD BE ABLE TO UNBUCKLE, GET UP AND WALK OUT

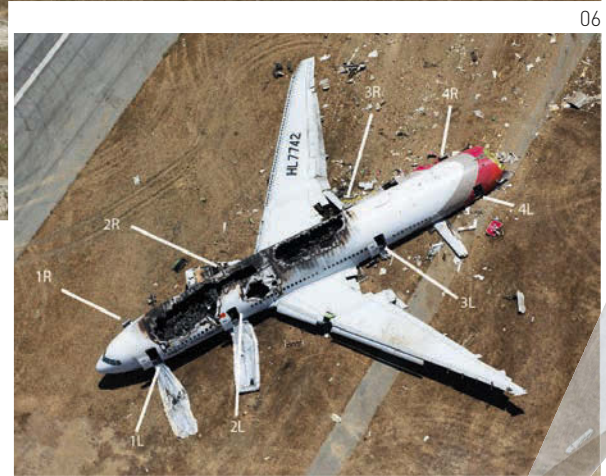
- 05. The Survival Factors Group has examined the evacuation slide/raft systems at the manufacturer's facility in New Jersey and is planning future testing of the systems
- 06. 106 people walked away from this wreckage physically unharmed

**LEARNING FROM 214** The biggest advances in cabin safety – stronger seats and fire-retardant cabin materials – came about in the 1980s when seat manufacturers were required to work on the impact a seat could withstand and remain intact, and increase it from nine times the force of gravity to 16 times. Around the same time, several accidents in which passengers survived an accident but died from the resulting fire prompted rules about what kinds of materials can be used in the cabin. These changes are responsible for a notable decline in the proportion of fatalities to air accidents over the past three decades, said Freeman.

“Every crash or incident is really different,” the Boeing engineer told me. “We have some charts that show accident rates and survivability and fatalities per accident and things like that. So in general if you take those over the past 10 years, we’ve seen a significant number of survivable accidents and very few fatalities.”

The NTSB declined requests for interviews, but people familiar with the process say that, as the agency continues to probe what happened, those in the Survival Factors group will examine the damaged interior and review the experiences of the flight and cabin crew and passengers.

They may be hampered by the damage in business class and the forward section of economy, some of which was



06

the result of the post-crash fire and firefighting efforts. Still, close scrutiny is already being given to the kinds of impact damage seen on the seats throughout the aircraft. What the NTSB learns about how the seats performed will be compared to the passenger injuries.

The business seats were equipped with shoulder harnesses, because unlike the seats in economy, where passengers have the seatback of the seat in front of them to cushion their head, larger premium seats don't have proximity to another seatback. Protecting the head in a sudden stop is an important component to survivability.

In an interview six months before the crash, Rakibul Islam, vice president of engineering at Zodiac Aerospace and a member of the SAE committee on seat design and certification standards, talked about seat certification. He explained that during a crash, “The brain is like Jell-O. You can compare it with Jell-O when it comes to movement.”

In an abrupt deceleration, “the brain also starts moving, so inside your skull the Jell-O is moving and getting impacted”. Seat designers must use either seats or seat restraints to protect the head. “The passenger should be able to unbuckle, get up and walk out,” Islam said.

Seats were most damaged in the C section of the passenger cabin. From row 36 and beyond, there were

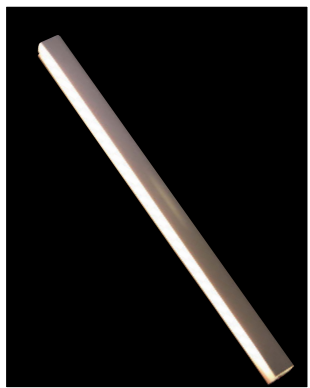




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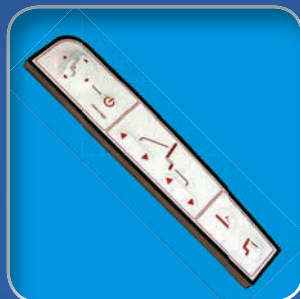
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## safety is NTSB's 'most wanted'

At the time of going to press, the NTSB is declining interview requests regarding aircraft seat safety on Asiana 214 as the accident investigation is still ongoing. However, the agency has confirmed that among its 'most wanted' list of transportation safety improvements in 2014 is the strengthening of occupant protection.

A particular focus is the establishment of an international aviation standard for restraining infants and small children onboard aircraft, as NTSB believes that all passengers on board, regardless of age or size, should be restrained in an age- and size-appropriate restraint device. In September 2013, at the NTSB's request, the US government submitted a working paper to the ICAO asking it to establish an international recommended practice regarding the use of child safety restraints (CRSs) on aircraft and provide recommendations and guidance that address the use of different types of restraints. In many countries, young children will be legally required to be secured in a restraint appropriate to their

age and size when travelling in a car to the airport – it makes sense for similar protection to be offered on the aircraft.

In 2012, the executive director of EASA wrote to the director of the Air Navigation Bureau at ICAO to enquire whether ICAO had planned any action regarding CRS. The letter noted the prevalence of international code share agreements and the challenges that parents face trying to sort out what methods are authorised to protect young children. Of note, the letter raised the concern that parents travelling with children, "expect to be asked to apply consistent aviation safety rules worldwide" and sought ICAO's help. The letter stated, "... ICAO involvement in this matter would be the most efficient way to achieve what is expected by the travelling public. I trust that any rule-making activity and/or recommendations by aviation authorities would be much better understood and implemented by air travellers, and better perceived and supported by operators, if ICAO would take a coordinating, or even better, a leadership role."



ICAO included the issue of CRS in the 2012-2015 work programme for the Cabin Safety Group, and has invited the American Assembly to establish an international recommended practice encouraging air carriers to use approved CRSs appropriate to each child's size and weight on aircraft; provide recommendations and guidance that address the use of different types of CRS and effective operator procedures; and to accommodate innovations in CRS based on future research and design.

The ICAO states that US government agencies must lead the way by setting sound policy and removing technical barriers to ease the transition and harmonise with other countries to avoid sending mixed safety messages to passengers travelling with young children internationally, as a result of inconsistent rules.

several instances in which supports were broken and seat rows were knocked down so that the backs were facing the ceiling. In one instance, a seatback was reclined onto another.

"In a 16g crash test, it should not do that," says Tom Plant, vice president and general manager of B/E Aerospace, a seat manufacturer whose products were not on the Asiana B777. When a seat or seat row falls onto another, it can cause serious injuries, obstruct evacuation or trap passengers. A flight attendant on the Asiana flight reported that a woman seated in 42E was stuck in her seat until a man "kicked and punched the seat, breaking it forward so the woman could get out". Even then, the woman's leg injury made her unable to move on her own, the attendant reported.

The 16g tests are designed to ensure that the seat stays attached to the aircraft structure, Plant explains, and in many cases that goal was successful. Another certification test confirms that the seatback will not break forward. It should cushion a body that may flail forward on impact.

"The seat attachment to the track is created for the survivability aspect and the breakover of the seat is done for the minimisation of injuries," Plant explains. After looking at the video of the accident and photos of the aircraft interior, Plant said he thought, "Wow, that's a level of movement in an aircraft in a crash that must be in excess of what we actually test for."



## TWO EVACUATION SLIDES FAILED. THAT IS SOMETHING WE NEED TO LOOK AT



**SLIDE FAILURES** While the accident is seen by many as confirmation that increased safety standards for cabin interiors are working, because passengers were protected during events greater than anticipated by the certification standards, at the same time, a number of things went wrong that could have had dire consequences; for example, two of the escape slides opened into the cabin interior, disabling doors and trapping two flight attendants.

"Four evacuation chutes were available and two failed," said Candice Kolander, safety, health and security coordinator for the Association of Flight Attendants, a labour union that advocates for safety but does not represent the Asiana cabin crew. "That is something we need to look at. Are the crashworthiness standards enough, or do we need to improve those standards?"

Parties to an NTSB investigation are limited as to what they can discuss while the probe is ongoing and phone calls and emails requesting comment from Air Cruisers, the manufacturer of the escape slides, and its parent company Zodiac, went unanswered.

The NTSB report says the slide release mechanism failed. Tests performed in November 2013 intended to



- 07. It will take a long time to yield all evidence from the accident site
- 08. Investigators and party members met in Seattle to examine the recorded flight data and compare it with the expected aircraft system's operation

discover what amount of pressure would cause such failure showed that between 1,465.8-1,766.4 lb of force could cause the release mechanism to give way. This information will help investigators understand the size of the multiple impacts, and could conceivably result in reconsideration of the certification standard.

Automated escape slides have evolved, becoming more efficient and effective, says Boeing's Freeman. Still, he acknowledges there is more to be learned from actual escape situations. "We're not at the pinnacle of design. Even though we haven't made dramatic changes in technology, we continue to make improvements."

Other companies whose products were on board Asiana flight 214 may review their designs in light of what happened. Investigators are trying to determine how much was stowed in the overhead bins, which are certified to a maximum of between 75 lb and 85 lb on the Boeing 777.

**THE PASSENGER ROLE** It's not just products that are being examined. Passenger and flight crew behaviour can also affect survivability. It is suspected that not all the travellers were wearing seatbelts during landing because the belt at seat 42B was found fastened. That seat and 42A were positioned in the doorway of the number 4 left-side door. The probe will try to discover if one or more unrestrained passengers were jettisoned from the aircraft.

Some people also retrieved their carry-ons before evacuating, according to reports by passengers and flight attendants filed with the NTSB. Flight attendant Han Woo Lee told investigators that she saw 10 to 12 people in a group "trying to get their bags out of the overhead bins".

"Passengers grabbing their bags has been such a problem for so long. We say 'leave everything behind, leave everything behind', but how as an industry do you change human nature?" asked Kolander, describing her experience with the phenomenon. "All you can do is give the evacuation command in order to get their attention and say, 'Get to your exit. Grabbing that mobile phone, that carry-on bag, is not more important'."

At least one passenger claimed to have been held up by people trying to gather items. The passenger in 17C who took his bag said it was more an act of habit than the result of decision making. He wrote, "If I didn't waste time gathering my carry-on, I could have evacuated faster. However, I could not have evacuated faster because I got my carry-on before my brain started working rationally. I imagine this is true for other passengers."

Following an accident, investigators look for ways to better protect people on board. The machine is only part of the equation; the experiences of both the passengers and flight crew can also provide clues as to how to make flying safer.

"This is a continuous learning process for us," says Boeing's Freeman. "The interviews with the passengers, the examination of the aircraft, the examination of the components in the aircraft and how well they performed are all a great source of information that we roll back into our design process to improve things." ☒

“  
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# guardianangels

Some of the latest cabin technologies that can make the safest form of travel even safer

Zodiac Aerospace

## Galley airbag

Zodiac Aerospace has developed an integrated airbag system that is installed directly into galleys to absorb energy in the event of a front-row passenger having a head impact. When airbags are installed in seatbelts, certification must be completed every time the seats are changed, but when airbags are fully integrated into front row monuments, certification is only required once.

The safety benefits of the airbag system also mean that the distance between the galley and the front-row seats can be reduced by around 4in, allowing additional pitch and potentially an additional row of seats.



Belt-Tech



## Belt and braces

A task that can be dull and time-consuming for crew to carry out is checking that seatbelts are properly fastened. The process can also be annoying for passengers if they need to be woken up because the buckle cannot be seen clearly.

Canadian company Belt-Tech believes it has a solution with its RTI (real-time information) systems. Put simply, each seat is fitted with a pressure-sensitive device so that the system knows which seats are occupied and therefore should have buckles fastened. If a seat is occupied, the system checks once-per-second whether the buckle is fastened, using conductive yarn built into the seatbelt fabric. The information can be relayed wherever the aircraft specifier wishes – perhaps through wires to a display mounted on the side of the aisle seat or wirelessly to a central control panel. Crew can then tend to anyone not properly buckled up when they should be.

During bad turbulence, being able to do these checks while seated, and inform passengers over the PA system, could be a life-saver for crew members – and for passengers, of course.



## RFID life jackets

Single-record life-jacket tags contain the birth record of the jacket, but the airline has limited ability to modify or add additional data once it is set by the OEM. Therefore in 2012, Airbus announced the requirement for all life-jacket suppliers to comply with the dual-memory tag criteria outlined by the ATA Spec 2000 committee, the governing board of RFID for aviation.

Spurred on by this, EAM Worldwide, in collaboration with EAM RFID Solutions, recently outfitted an easyJet Airbus with RFID dual-memory enabled life-jackets, making it the first A320 to use dual-memory tags on board.

The dual-memory jackets enable EAM to write the birth record (part number, serial number, date of manufacture, etc) of each life jacket during the manufacturing process, while creating a rewritable section – known as the lifecycle record – for the operator to use. They can write internal data requirements into the vest tags and use the tags for tracking purposes such as recording overhaul dates. Operators can also detect data corruption between the information that was written to the tag and that read by the software.

The company has also developed an RFID Safe Seal to detect the opening of under-seat jacket containers and other restricted items on board the aircraft, eliminating the need for manual counts and inspections. The electronic seals are designed to be quickly replaceable and are residue free. The system also enhances user awareness of tampered tags with alerts, making checks more time-efficient.



## An automotive approach

A new technology for aircraft cabin safety has been developed by Aviation Occupant Safety (AOS), a newly formed joint venture between two safety restraint industry specialists: Aircraft Belts Incorporated (ABI) and Key Safety Systems (KSS). The business of AOS is to bring proven automotive airbag/inflatable safety technology to the general and business aviation market. Specifically, AOS will focus on offering the general aviation market inflatable protection solutions at the OEM level, as well as the aftermarket segment of aircraft owners/operators.

Initial product development for AOS will focus on forward-facing inflatable restraint solutions for passengers and crew in a typical forward-facing seat configuration, and side-facing inflatable solutions for passengers occupying a divan as typically found on larger business aircraft.

The forward-facing solutions feature an inflatable device embedded into woven tubular webbing presented in a two- or three-point inflatable lap belt. It is claimed to be less bulky and more comfortable to wear than other systems presently available.

The forward-facing designs also incorporate Key Safety Systems' proprietary impact sensing and diagnostics technology, as well as mistake-proof buckling that ensures that aircraft crew won't inadvertently buckle a belt into the wrong buckling receiver.

David Devine, president of ABI and a director at AOS, forecasts a tremendous opportunity to bring the technological advances of automotive airbag safety to aviation. "We see our partnership with Key Safety Systems as the perfect complement to our aircraft seatbelt business. Together we can develop and bring higher levels of safety to thousands of aircraft owners, operators and passengers worldwide."

Worldwide

## Smooth operators

February 2014 saw two incidents in which flights with turbulence of sufficient force injured passengers. The incidents – involving Cathay Pacific and United Airlines flights – clearly reinforce the importance of proper seat restraints, but also push forward the need for better detection of imminent turbulence so it can be avoided, or passengers and crew warned.

There are a few such projects under way around the world. In Europe, a laser-based measurement project called DELICAT (demonstration of lidar-based clear air turbulence detection) is being tested by the German Aerospace Center. A lidar (light detection and ranging) instrument installed on board an aircraft emits short-wave ultraviolet laser radiation along the direction of flight. The density of the air is determined from the backscatter value measured for the oxygen and nitrogen molecules in the air, and fluctuations in this density then provide information about the turbulence. The long-term goal is to develop an integrated detection system for avoiding air turbulence. In future, pilots might then be able to announce a message in the aircraft cabin asking passengers to return to their seats and fasten their seatbelts, or they may even fly around the affected region.

In the USA, the NCAR Turbulence Detection Algorithm (NTDA) is being further developed, which makes use of the wind variability data provided by Doppler weather radars. Scientists at RAL (NCAR's research applications laboratory) are working on a prototype that processes Level II data from 133 NEXRADs around the USA and produces a 3D mosaic of in-cloud EDR, which is updated every five minutes for use by flight crews and air traffic. The NTDA data is also being incorporated into a new Graphical Turbulence Guidance Nowcast product, aimed at giving pilots in-cloud turbulence information in the cockpit in nearly real time, showing around 100 miles ahead and 40 miles to either side of the planned route.

Romtex



## light and smart

A lightweight belt with a 353 anodised buckle has been developed by Romtex, and is available in different colours and with an up-to-date design.

The belt's main characteristics are that it complies with TSO C22g standards, is suitable for premium and economy classes, has multiple colour options for the webbing and buckle, is available with custom-finished logos and buckles, has a 90° buckle release, and is strength-rated up to 3,000 lb.

The light belt is currently being promoted to airlines and seat manufacturers around the world. Airlines including Sky Airlines, and seat manufacturers Pitch, ZIM Flugsitz and Zodiac Seats are currently evaluating the product.

Schroth

## Ultra-lightweight lap belt

The Schroth AirLite passenger lap belt is an ultra-lightweight design with a mass of less than 235g (0.518 lb) to help reduce the total cost of ownership through fuel savings, while meeting strength requirements such as TSO/ETSO C22g and dynamic 16g. The AirLite's weight savings are achieved through the extensive use of high-performance materials and advanced design solutions. The ergonomic buckle design, as well as a wide choice of webbing colours and logo engravings, permit customisation. The company also offers matching extension belts, infant/utility belts, demo belts and Y-belts as complementary accessories.





## Load transmission in CFC fuselages

In the framework of the Fiber Force research project, which started in 2010, Lufthansa Technik, working with the German Aerospace Center (DLR) and the Technical University of Darmstadt, has developed methods for load transmission into carbon fibre composite (CFC) aircraft fuselage structures for VIP customer aircraft.

New generations of aircraft, such as the A350 and the B787, are manufactured predominantly out of CFC. As these aircraft will also play an increasingly important role for VIP customers in the future, appropriate changes to the original aircraft structure are essential for manufacturer-independent modifications and individual cabin solutions. It must be made possible to install specific cabin components at the desired location in an aircraft, and the primary structure must be reinforced in such a way that the additional load can be introduced and distributed safely.

Within the project, which is funded by the German Federal Ministry of Economics and Technology, it is now possible to define the maximal load on the floor panels for the first time,

and to develop highly efficient connectors, known as floor-panel hard points.

These components, comparable to inserts, are small enough to fit into the palm of the hand and can be individually fitted to the cabin floor by gluing them to the floor panels. They facilitate the flexible fixing of special cabin fittings, such as cupboards, tables and partition walls, with a maximum load of 3,000N.

“The results of the Fiber Force research project and the resultant force transmission concepts help us decisively in the VIP Completion business to continue successfully meeting the challenges of installing cabin interiors in the new CFC aircraft designs,” explains Dr Hans Schmitz, SVP of VIP jet solutions at Lufthansa Technik.

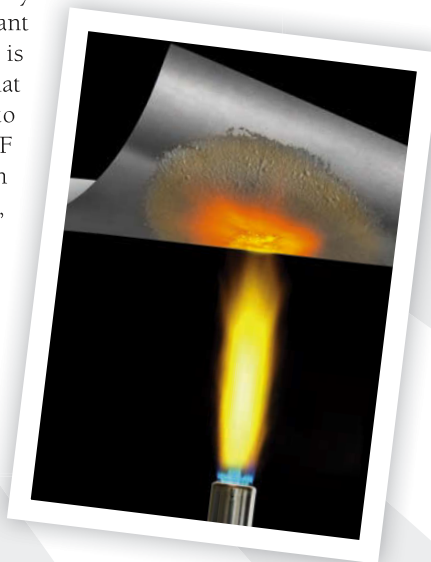
The results of the research project and the know-how acquired are already being used in current Lufthansa Technik completion projects. A total of 40 of the newly developed floor-panel hard points are currently being installed in a B747-8.



## Nomex flame barrier

DuPont has launched Nomex XF, a novel material that helps protect aluminium fuselage aircraft by providing a robust and lightweight flame barrier that can help prevent outside fire from penetrating the cabin, giving passengers additional time to escape such a hazard. It can also help prevent flame propagation so that aircraft insulation will not spread fire.

The material has been designed for use in commercial aircraft and can be readily incorporated into designs compliant with FAR 25.853 and 25.856. It is intended for use in applications that require flame resistance up to 1,100°C (2,000°F). The Nomex XF flame barrier offers flexible, thin and very lightweight protection, and can be incorporated into thermal acoustic insulation constructions. It has no flame penetration after 10 minutes' exposure, more than doubling the burn-through time requirements of FAR 25.856(b).



## AmSafe gets safer

The AmSafe Seatbelt Airbag was developed as a cost-effective method of 16g compliance for difficult-to-certify seat placements. In an accident, an inflatable bag stored in the lap belt portion of the seatbelt protects passengers of all sizes from traumatic head and neck injury.

AmSafe has improved on the technology and developed a version of the airbag system that is sleeker in design with more compact airbag lap belt packaging and a new lightweight buckle, is 30% lighter, contains wireless built-in diagnostics and is optimised to support fleet-wide retrofits.

## Sight-impaired training

This isn't a technology, but a worthwhile initiative. Blind passengers can't watch the safety demonstration and identify the emergency exits, they can't see masks dropping down or fit them, and just have to imagine what tabs the flight attendants are referring to when they explain how to inflate a life jacket.

Some Alaska Airlines employees took a big step to improve this experience when they invited a group of 50 people to visit the carrier's Seattle maintenance hangar and board a Boeing 737, where they were given specific verbal information and allowed to touch portions of the aircraft not normally available to them. The group included individuals who are blind or have poor vision, travelling companions, family members and several service animals.

Though the aircraft didn't take off, the volunteer flight attendants did their best to simulate a real flight, complete with boarding and disembarking, a safety briefing, inflight announcements, snacks and water service. The passengers also had time to get acquainted with the exterior of the aircraft and tour the interior from the flight deck to the galley. Flight attendants helped them identify the call button and described

how to reach the lavatories. Participants were able to touch and try on safety masks and life vests, and they could also visit the flight deck to feel the controls.

While most of the visually impaired people who attended said they had flown before, they embraced the opportunity to learn more about the aircraft without the stress of being on an actual flight.

"I think this is wonderful," said Gloria Walling, one of the attendees. "I've flown before but I've never seen an oxygen mask. I want to be able to touch it and try it on and see how it works. I don't want to have to figure it out in the middle of an accident."

Another participant, Karen Strudwick of Seattle, said being comfortable with flying is more important than ever as it becomes more routine and everyone is expected to know the ropes, regardless of their situation. "The training event was among the most useful that I, as a blind person, have ever attended, and what I learned, particularly from the hands-on experiences, will be invaluable in my future air travel," she said afterwards.



## Fire simulation

Fire simulation models are already available to simulate fire development in an enclosure, but the SmartFire fire simulation software developed by the University of Greenwich in London further enhances such systems by incorporating a range of sophisticated submodels (flame spread along fuel solid surface, eddy dissipation combustion model, turbulence, radiation, toxicity, smoke optical density, etc).

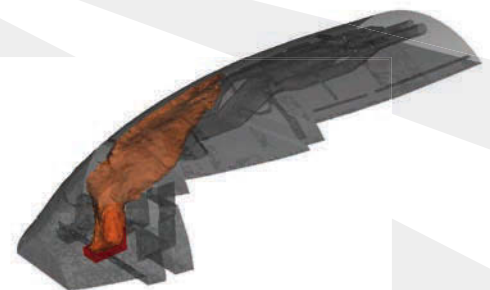
The project will see the testing of new physical models related to composite materials in aircraft, validated by experiments and introduced into the numerical code to simulate fire ignition, combustion, heat transport, burning of solid fuel, radiation, toxicity, etc. This contribution will enhance the description of the fire's evolution during inflight and post-crash fires, in full-scale conditions. The flashover time will be accurately evaluated using information obtained both from measured material properties and from fire behaviour identified during laboratory tests. It will check whether flashover must be considered as the main threat to passenger survivability. Hypotheses will be introduced on the fire ignition source location and type.

For post-crash fires, the SmartFire software is coupled to the Exodus Evacuation software, which is

used to predict the evacuation of passengers, including factors such as passenger movement and behaviour, toxicity and hazards. The package was developed for applications such as checking compliance with 90-second certification requirements, crew training and accident investigation. The Exodus software takes into consideration people-people, people-fire and people-structure interactions.

The project aims to adapt this software to new risks in new-generation aircraft, where the load of fuel material increases in weight and in potential heat release rate.

The university is also carrying out additional studies on detection and suppression technologies. With the exception of flame emission, modern detection systems do not define the nature of the fire, and they are not linked to the burning materials. Thus, the role of fire signatures is only very broadly addressed by means of detection. ☒



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# changes in the air

Passengers pay for aircraft, so they deserve to be looked after, says the VP of product management at Lufthansa German Airlines, Dr Joachim Schneider

MARISA GARCIA



According to Dr Joachim Schneider, vice president of product management at Lufthansa German Airlines, passenger preferences (based on extensive customer surveys and 5,000 dedicated customer interviews) were the primary drivers for planning the carrier's new aircraft interiors.

While acknowledging the important roles that their in-house designers and a strong engineering team played (cooperating with outside designers and key suppliers) in realising those stated passenger preferences, the message from Schneider is consistent and clear: "Start everything around the customer." He tells us that while it is important to focus on the process of design, and the requirements for certification and product development, the changes Lufthansa makes in the cabin are ultimately tailored to meet its customers' needs.

Of course, it's not that straightforward though. "Customer expectations are changing," Schneider explains.

Customers place tall orders on airlines, with ever-growing demands for improved service, greater comfort and a cabin experience that is up to the standards of their everyday lives. The logistics of meeting those expectations present great challenges for airlines, and Lufthansa is no different.

Lufthansa's approach to these increasing customer demands is to push forward with the necessary expertise and an ardent determination to satisfy the desires of their customers, while working within the industry's processes and certification requirements.

**BUSINESS MATTERS** For example, Schneider tells us that the development of a fully flat business seat was a customer priority. He says, "The seat had to satisfy many other criteria, like the best seating comfort (infinite adjustment of seating positions, Lantal pneumatic cushion systems), more privacy, larger stowage space, easy access to seats, larger IFE screens and an intuitive and calm design."



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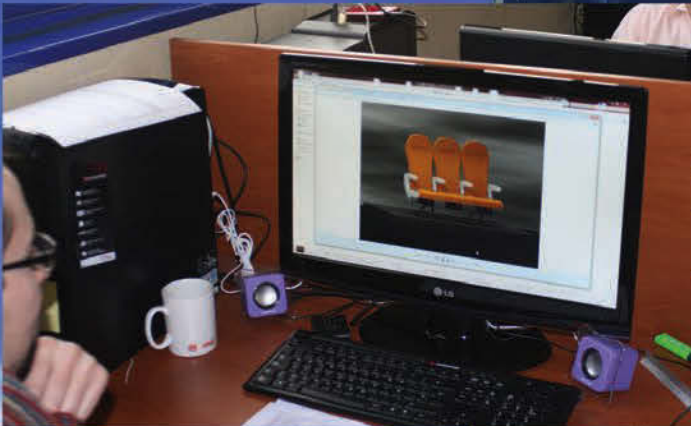
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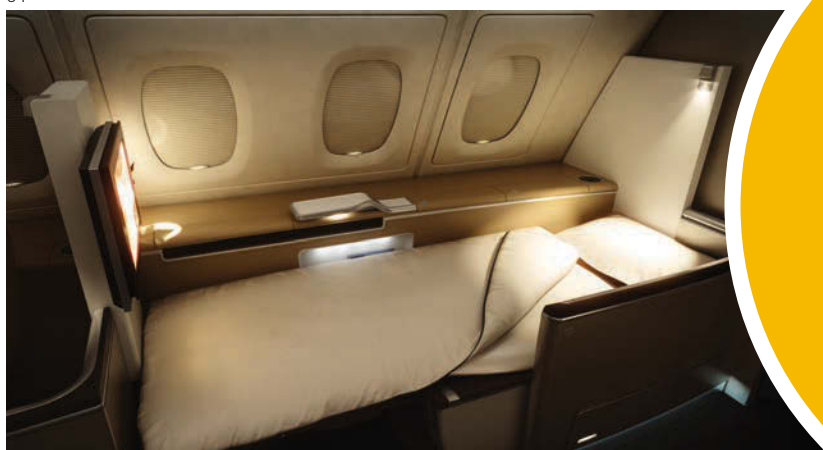


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01



02



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Quite a list, especially when combined with other cabin elements that the airline found enhance the overall experience for its passengers, such as divider curtains that function as doors, and galleys transformed from a pure working area for the flight crew into comfort areas for passengers who require a light snack or refreshment.

To meet its passengers' exacting requirements, Lufthansa pooled together resources from its in-house teams and from outside designers and suppliers. Going back to the example of the new business seat, Schneider tells us, "To meet these requirements, the new seat configuration was developed together by Lufthansa, B/E Aerospace, Lufthansa Technik and PearsonLloyd."

**SEAT COMPANIES SHOULD WORK TOGETHER** Despite Schneider's evident enthusiasm for the process and excitement over the new product offerings, his views are grounded in the realities of the peculiar challenges the aviation industry presents for design innovation. A strong in-house engineering team helps, and Lufthansa is proud to say it has such a team, but there are factors in the

overall aviation requirements that try the capabilities of any engineering organisation.

Parts and component certification are a particular challenge, Schneider confides. The process of harmonisation between FAA and EASA is ongoing and sometimes results in the generation of new requirements. When these certifying authorities change requirements, Schneider tells us, it adds further complexity to the process. It is more than a matter of FAA vs EASA, as each country into which an airline attempts to introduce a new product may have its own requirements.

Schneider points to two areas providing the greatest challenges: the certification of seats and the introduction of new materials. Seats continue to pose special hurdles because of the number of parts involved, each with separate certification processes, which must then be certified in combination with each other.

He presents us with a provocative suggestion for seating, which could yield great benefits to aviation, indicating that major seating suppliers should join forces on seat elements that are "behind the curtain". That is to

01. Lufthansa decided against suite-style seats for its A380 first class cabins

02. A comfortable bed in the A380 first-class cabin. In the airline's B747-400s, first class features separate seats and beds

- 03. For its bespoke B747-8i business class, Lufthansa drew on PearsonLloyd's experience in furniture design
- 04. From seat comfort, to interior design, to entertainment, flyers are seeking the same standards they enjoy at home

say, components that do not form part of the product's aesthetic differentiation.

Even competing seat manufacturers, Schneider explains, can make a concerted effort to select common and interchangeable 'hidden' elements, such as seat actuator systems, which are unrelated to an airline's unique design product offering, or a seat manufacturer's innovation.

By providing a "common base for seat components", Schneider suggests, seat manufacturers can greatly improve the process of developing, installing and maintaining aircraft seats. He points out this would speed up product certification, and reduce the parts required, ensuring a leaner design. The benefit of this, he points out, extends to improved product lifecycle reliability and enhanced maintenance of product in service, with a concentration on reducing the total cost of ownership.

**SUPPLIER SOLUTIONS?** Asked about the solutions to these matters provided by catalogue seating options, Schneider says, "As an industry still in the learning phase, catalogue selection makes sense, but it is too limited. Airlines need to break out [for product differentiation]."

He believes the real benefits will come from commonality of components with neutral effect to the airline's branding initiatives.

The issue of introducing new materials to the cabin, he says, is the lack of predictability of the certification requirements that depend on local authorities. A strong in-house engineering team, he suggests, can overcome any objections by authorities when trying to use new materials.

Industry suppliers and manufacturers can assist the process by introducing innovations that are easier to adopt, developing reliable capabilities, and providing products that are easy to maintain over time. To meet the needs of tomorrow's passengers and design tomorrow's cabin, Schneider tells us, airlines, manufacturers and OEMs need to work together to develop competencies and a collaborative mindset.

**A NEW TAKE ON WIRELESS IFE** The standardisation of IFE systems would also facilitate seat certification, and improve the turnaround of new cabins. Schneider points out that the current mix of products differ greatly in this area and that it is difficult to integrate between various providers. In future, he predicts, new technology may

“

A STRONG IN-HOUSE ENGINEERING TEAM CAN OVERCOME ANY OBJECTIONS BY AUTHORITIES WHEN TRYING TO USE NEW MATERIALS

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05

06

“THE WORK OF REALISING CUSTOMERS’ HIGHEST EXPECTATIONS PRESENTS A CHALLENGE, BUT THE KEY IS TO PERSIST AND FOCUS ON INNOVATION”



07

- 05. The new business seat, manufactured by B/E Aerospace, offers privacy around the head without needing dividers
- 06. Dr Schneider believes that soft product can be just as crucial as engineering in creating a premium passenger experience
- 07. A sophisticated leather trim helps reinforce the feeling of a quality piece of domestic furniture

eliminate the wires required to operate these systems. While this may seem beyond the industry’s capabilities at present, he feels it will soon become standard. Customer expectations come into play here again, with passengers demanding more from IFE. Lufthansa will not wait for the future to satisfy these customer needs, says Schneider.

The selection of seat-centric systems will reduce the complexity of the system for passengers. The airline has accommodated a second screen integrated with the first screen to duplicate a home environment, so that a passenger is entertained on one, while remaining informed with the other.

Lufthansa has looked beyond the hardware to the software in the passenger experience with the introduction of BoardConnect, a Crystal Cabin Award-winning innovation developed by Lufthansa Systems, which provides a broad selection of wireless IFE and onboard services direct to the passenger’s personal electronic device. With this service, airlines can provide an IFE product on aircraft not outfitted with IFE hardware, eliminating the need to modify and recertify seating.

“With BoardConnect,” Schneider says, “Lufthansa is enhancing the digital entertainment/information and service offer on continental flights in European aircraft and is using the high penetration rate of mobile devices of

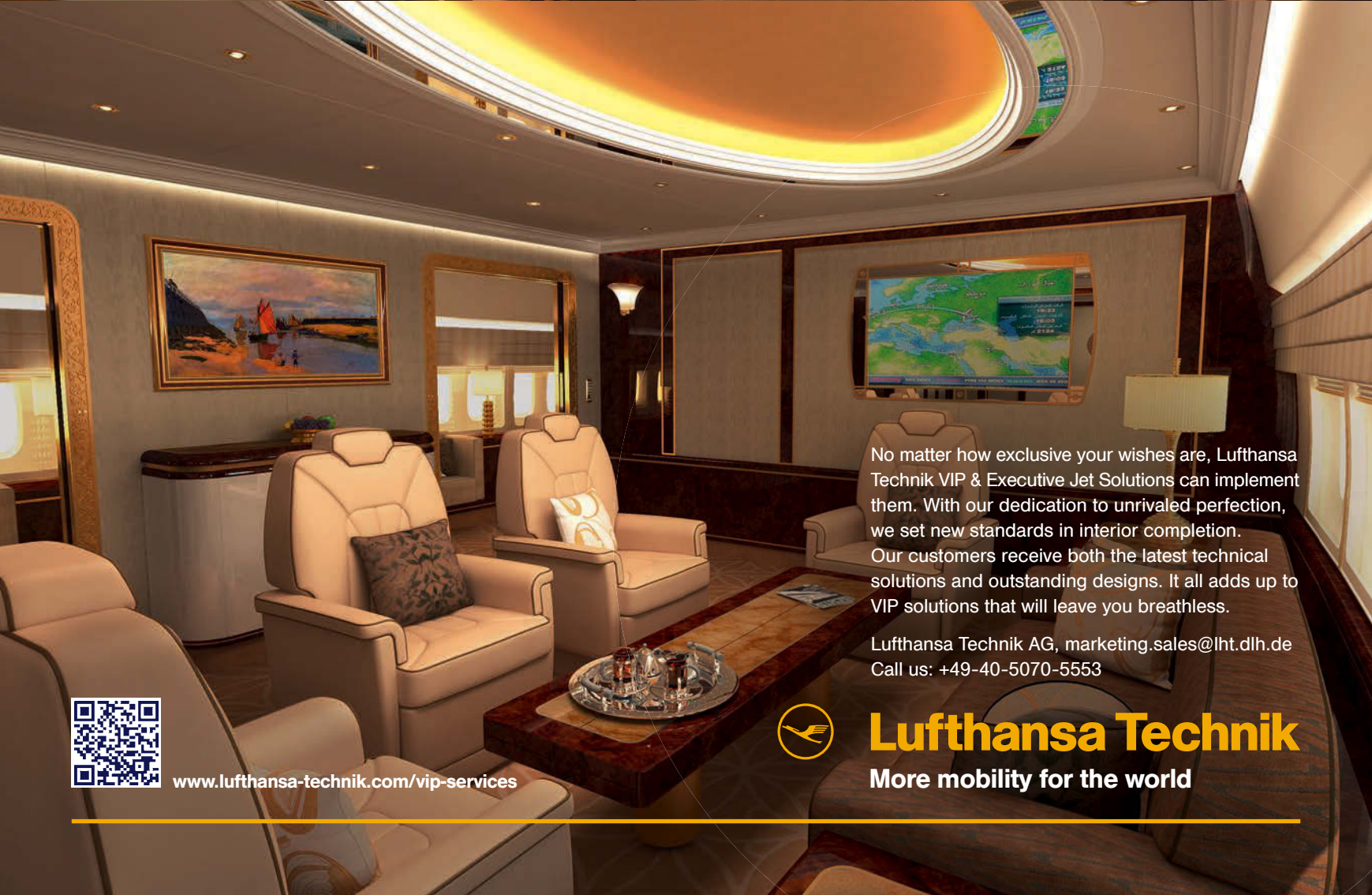
its passengers,” – what he calls the BYOD (bring your own device) approach. “In the medium term,” he continues, “the service of internet connectivity is to be extended and will differentiate the service experience of our guests on medium-haul flights. On long-haul flights we already have an innovative service with FlyNet, and this service will be complemented in the future by developing a portal, similar to BoardConnect. The long-term objective is to offer consistent and contextual services on all flights, from short haul to long haul.”

Lufthansa’s customers need more than this. Schneider emphasises that customers now look at more than the cabin design and the IFE for comfort and when recognising an airline brand as providing premium service. Thus Lufthansa is also redesigning ‘soft’ elements of the cabin experience, like the development of new ways to prepare and serve inflight meals.

The work of realising customers’ highest expectations presents a challenge, Schneider concedes, but the key is to persist and focus on innovation.

Over the coming years, he predicts, these qualities will become ever more important. The industry, he tells us, “always needs to deliver value and to make travel an easier and more delightful experience”, at the same time that it ensures products are “certifiable and feasible”. ☒

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# openingdoors

New York-based LCC JetBlue is introducing Mint, a dramatic new product that looks set to shake up the US domestic market

ADAM GAVINE



PHOTOGRAPH COURTESY OF  
JETBLUE/BEN KAUFMAN

# factorydesign

A futuristic airplane cabin interior. A man in a dark suit and tie stands in the aisle, holding a tablet. A woman is seated in a white and gold leather seat, looking towards the man. In the foreground, a glowing blue interface displays a globe of the Earth. The cabin features modern, curved seats with integrated screens and a sleek, metallic finish. The lighting is dim, with blue and gold accents.

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01. JetBlue can keep its new premium passengers behind closed doors

01



When JetBlue began service in 2000, it created a commotion in the domestic US air travel market. The New York-based upstart introduced lower fares than its competitors, new aircraft, leather seats at a generous pitch, and then-CEO David Neeleman had a mission to “bring humanity back to air travel” through core brand values of safety, care, integrity, passion and fun, and a passion for innovation. However, 14 years later, passengers’ expectations of air travel have evolved, meaning it is time for JetBlue to evolve and innovate to differentiate itself in the fierce domestic carrier market.

A prime opportunity to bring in new cabin products presented itself with the order of a new subfleet of A321s, and the airline has really gone to town. With its new Mint product, JetBlue is not just looking to pitch itself as a better passenger experience than other low-cost carriers, but is also looking to poach the legacy carriers’ premium transcon passengers.

Not only does Mint include 12 lie-flat doubles that are the longest and widest in the US market, it also offers four private suites – a first in the domestic US market. Rows one, three and five in the new A321s are configured 2-2, while rows two and four are 1-1 with private suites – complete with door.

The seat is a heavily customised version of the Vantage model from Northern Ireland-based Thompson Aero Seating. Project leader Don Uselmann, JetBlue’s manager of customer experience, and an eight-year veteran of the airline, explains why they chose a smaller overseas supplier rather than one of the American giants: “Our competitors on the routes the Mint experience will be flying are all using the same off-the-shelf seats in business class. We looked to Thompson because they were willing to work with us to create a fully customised seat. The reason this is so special to us and we think it will shake up the marketplace is that it truly is one of a kind.”

## the fastest web in the west

JetBlue has continued its pursuit of innovation by becoming the first airline to implement high-speed Ka-band satellite connectivity through a partnership with its IFEC subsidiary LiveTV, as well as satellite provider ViaSat. Fly-Fi, its branded inflight internet product, is the result of a two-year development programme, and is claimed to be up to eight-times faster than some rival systems. During the beta period rollout until June 2014, the basic web browsing package – called Simply Surf – is free to use. For more intensive users, Fly-Fi Plus, a live video streaming high-bandwidth plan, is available at US\$9 per hour for applications such as streaming movies or large downloads.

“When we launched Fly-Fi, we again decided to be contrarian and not do what other airlines are doing,” explains JetBlue’s Don Uselmann. “We built our own solution, pretty much from the ground up, with our business partner ViaSat, which was aided by the launch of the ViaSat-1 satellite. We leveraged our relationship with LiveTV to be the integrator of the product. It blows away the competition and is another example of JetBlue doing what it does best, which is to create a better product and to offer it for a much lower price.”

More than 140 aircraft in the fleet will be equipped with Fly-Fi by the end of the year, with up to 15 of the A320 and A321 fleet receiving upgrades per month, while the Embraer 190 fleet will be completed in 2015.

If you think the claimed Fly-Fi speeds are exaggerated, JetBlue is urging users to test their connection with SpeedTest.net (a standard for internet speed measurement) and post their speeds using #WiFiFlightSpeed on social networks. “Travellers should be able to see the speeds of all wi-fi systems in the sky and make an informed choice,” says Marty St George, JetBlue’s senior vice president of marketing and commercial strategy. “Customers should demand fast broadband and should discover what true broadband inflight connectivity means.”

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02

## Another first

When JetBlue received FAA approval for gate-to-gate personal electronic device use at 4:15pm on 1 November 2013, by 4:30pm it was being offered on Flight 2302 from JFK to Buffalo, making it the very first US commercial flight to allow gate-to-gate PED use. See page 120 for an in-depth look at PED use policies and problems

Another reason for the selection of the Vantage is that it offers a good combination of cabin density and comfort for a narrow-body, and only two guests don't have direct aisle access.

The single seat is included as a result of engineering, not marketing. As Peter Tennent, a director at London-based Factorydesign, which worked with Thompson to create the Mint seats, explains, the layout is a consequence of the architecture of the seat. When Vantage is used in a narrow-body, the feet of the passenger in the suite go into the armrest space of the double in front, so it must be laid out with alternate pairs and singles running down the aisle.

Lone travellers may favour a single seat, which is a great offer in itself. But JetBlue took that product a step further and embraced the idea that some passengers will regard the single seat as superior and proposed the idea of a door to create a private suite.

"That's the point when JetBlue becomes unique in America," says Tennent. "That single seat with a door is a substantial offering, even compared to American's transcontinental first class. In terms of real estate on an aircraft, you get an enormous amount of space." Tennent is passionate about the suite, referring to it as a "throne" and a "hero product".

Of course, adding a door means taking away a little space from the passenger, but the generous width of the suite (22.3in in both seat and bed mode, while the doubles are 20.6in with a bed width of 22.6in) meant there was no real detriment to comfort. The only downside of adding a door was a significant amount of recertification work, all handled by Thompson, although no complex issues arose.

Seat comfort is further enhanced by the inclusion of air cushions which offer adjustable firmness, a massage function, integrated laptop and shoe stowage spaces, and

## tailored entertainment

Florida-based LiveTV, JetBlue's wholly owned subsidiary since it was acquired in 2002, provided the 15in displays in Mint and the 10.1in displays in the core product on which up to 100 channels of live television programming from DirecTV are available, as well as SiriusXM radio and a moving map.

The design team for the new Mint product worked with LiveTV on the styling of the Mint IFE handsets, benchmarking consumer products from the likes of Apple and Bang & Olufsen.

In other LiveTV news, in January it became the first company to gain FAA Supplemental Type Certificate approval on a more stringent requirement for bird strike testing for its radomes mounted on the top of aircraft. To gain the approval, LiveTV had to conduct actual bird strike tests – using a 4 lb bird at speeds of over 400mph – to demonstrate that a flight could be successfully completed when a radome sustains structural damage.

a 'wake me for service' indicator if the customer chooses to sleep in.

**THE TABLES ARE TURNED** A key part of the Mint project was a complete redesign of the table arrangement in the double seats. In the standard Vantage, the tables rotate out sideways from the centre console and then bifold, and because two passengers share the centre armrest they have to be stacked in the console, which is a complex arrangement.

In the JetBlue design, the two single-leaf tables are relocated to the vertical part of the centre console, and when needed, they drop down forwards and then tip sideways towards the passenger. This simplified table mechanism – designed by Factorydesign and engineered

02. The high-quality PCU for controlling the seat actuation adds to the feeling of modern luxury

## Wylde ideas

Discussing his client JetBlue's place in the highly competitive North American market, and how it has changed since it launched 14 years ago, designer Paul Wylde says, "The whole world has changed and JetBlue is competing against innovative carriers. Virgin America stole their mantra of innovation, and JetBlue wants to reclaim its territory.

"Virgin is the one people talk about at dinner parties," he adds. However, that market disruption is great for flyers, and you can bet that other rivals are looking for innovations.

"Airlines are definitely starting to understand the power of brand-led design to differentiate and create a brand experience," adds Wylde. "That's the big evolution at the moment, and the battleground in the next 10 years will be to integrate ground and air, the digital and the physical. Airlines have raised the expectation of what happens inside the cabin by doing such a great job outside of the cabin. I think the last great challenge for all airlines is raising customer service levels to match what is going on with the websites, lounges and interiors. I think we're going to see a lot of investment in people engagement in the coming years, especially with the legacy carriers. Designers have to think how design can create more meaningful connections between crew and passengers."



03. Part of the extensive redesign of the Vantage seat included moving the tables up to the vertical part of the centre console

by Thompson – is now being integrated into all future Vantage seats.

The tables, as well as functioning better, also enabled the centre console's dimensions to be reworked to allow greater privacy if wanted, while still providing the ability to communicate with one's neighbour.

"That's quite a subtle bit of refinement; if you go too high you disconnect them and if it's too low you don't provide enough privacy," says Tennent.

As Tennent adds, "Tables are always an enormous challenge for designers – they are the devil – and successful seats are the ones that deal with that problem among other things."

**FRESH DESIGN** The overall cabin design was handled by Paul Wylde, founder of the paulwylde brand and design agency, based in Seattle and San Diego. Wylde's brief was to help create the Mint brand strategy, to manage the design strategy and creative direction for the cabin interiors – both for new product and refreshing the core

product – and to create concepts, ideas and proposals for the overall JetBlue experience on the ground and in the air: what the airline calls the 'travel ribbon'.

One principle that drove the cabin design was that the front and rear had to be integrated, with a consistent design language. This is because JetBlue wants to ensure that while it is introducing premium products, it does not want to give the feeling of separate classes (see page 120 for more details). Hence there are no divider curtains, as the cabin is about inclusivity not exclusivity, and work focused on how to break up the cabin visually while retaining a sense of community.

Three CMF schemes were developed, and the airline decided to stick with its traditional predominantly grey palette. However, the grey was darkened to a graphite shade, which feels more premium and sophisticated, with colour brought in through the translucent blue plastic screens that separate the Mint seats, and through coloured seat piping, which also helps to subtly differentiate the seating products – blue in Mint, orange in Even More Space (extra pitch), and grey in the core seats.

"This is where JetBlue differs from Virgin America. Virgin America is like a hip flying nightclub and it is innovative, but does it its own way," says Wylde. "JetBlue is innovative, but more about the understated performance aesthetic."

**CORE PRODUCT** JetBlue's core product also received some design attention. The seats are still the B/E Aerospace Pinnacle, and the grey leather the airline was so proud of 14 years ago remains, although in two tones of pale and graphite grey. The seats are well specified, with movable headrests, a 10.1in IFE display, and a decent 33in pitch. Where it became JetBlue's own product is the seatback, which has been redesigned to look sleeker and feel more like it is part of the environment of the passenger looking at

03





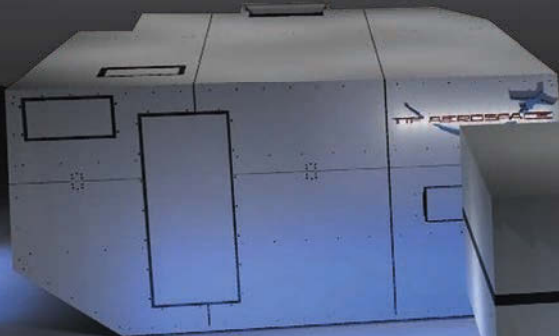
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## one for all?

Introducing a new class of product is usually a cause for fanfare. However, it presented a particular problem for JetBlue: as it prides itself on being a 'classless' airline, delicacy was required.

"The brief was to introduce flat beds without bringing in hierarchy," explains Paul Wylde, who was heavily involved in the branding. "Mint forced JetBlue to think hard about its whole philosophy and whether it truly will be classless or if it is starting to offer hierarchy. JetBlue was founded on being a classless egalitarian brand, but it was bringing in a product whose semantics are absolutely about class. So we brought in the idea that it's not about class, it's about options. So the seat brings options of sleep, added comfort and privacy. If you build a product around lifestyle, and promote it around lifestyle, you are encouraging people to think about function, not hierarchy."

To paraphrase George Orwell, it sounds like all passengers are equal, but some passengers are more equal than others. We asked JetBlue's head of customer experience, Don Uselmann, about this sensitive subject and he said, "We don't look at the experiences we offer as classes of service. This is why I don't believe in terms like 'premium economy' or 'first class' – those types of words are not in our vernacular. Our mission is to offer the best-possible product for our core experience, and then offer different experiences for those looking for more. You see that with our Even More Space product, for example, with a small incremental charge for a different type of experience. We look at the Mint experience in the same light – it's for those looking for an enhanced experience. JetBlue is evolving from a one-size-fits-all airline, to an airline that allows our customers to personalise and customise their experience in a way that is one-of-a-kind and truly accessible from a pricing standpoint."

04. Marketplace is open to all passengers, and its blue plastics tie in with the Mint part of the cabin

it than sitting in it. The seat pocket has been replaced with a net pocket, and in response to feedback from customers that they would like a place to put drinks when they either don't want to or can't use the tray table, a drinks holder was added to hold bottles of water or coffee cups.

The same treatment went into the Even More Space seats in rows 6-10 and 18-19, which are the same product, but with 37-41in pitch, and demarked with orange piping around the headrest.

**MARKETPLACE** Between Mint and Even More Space in the cabin lies a really special feature. "Much of our design exploration was about encouraging genuine and spontaneous connectivity between JetBlue crew members and customers. This is what makes the brand so special," says Wylde. "It's the humanity, the personality – so design played a big part in enabling JetBlue crew to shine even more than they do now."

This design exploration centred around what they called an 'innovation space' between the middle exits. Ideas explored included Bar 15, an inflight refreshment bar where guests could spend 15 minutes before making room for other passengers; an inflight coffee shop where three passengers at a time could relax with a Nespresso; a stretching space; and an area where third-party sponsors such as Disney or Whole Foods Market could use the area as a promotional space that would also benefit passengers.

However, the idea that made it through was Marketplace, an inflight self-service snack bar. Its first design proposal was as a 'Gourmet Galley', complete with bridges, ovens and display systems. However, the design was toned down a little, and a simpler self-service snack bar monument was created in conjunction with Zodiac, with lots of dry stowage space for snacks, and two B/E Aerospace chiller inserts for drinks – fronted by more of the blue plastic.

A great feature, but the best thing is that it is available to all passengers. "This is one of my favourite enhancements," says Uselmann. "We love getting customer feedback and we heard that they love it when we set up a snack bar in the galley. On the A321s, customers can get a snack while they stretch or go to the restroom – and they don't have to ask the crew. We are the first carrier to do this domestically and the first to do it on a narrow-body."

This doesn't mean the end of inflight service though. Indeed, a snazzy idea being mooted is for crew to change into chefs' jackets during meal service. It's a great, simple idea that JetBlue crew love, and hopefully it will happen.

So what else does the future hold? "The big hook for us internally is that we turned 14 in February and you're about to see a top-to-bottom refreshed JetBlue experience start emerging this summer," says Uselmann. This includes a new crew uniform design, and a retrofit of the new interiors into the rest of the fleet. ☒

04



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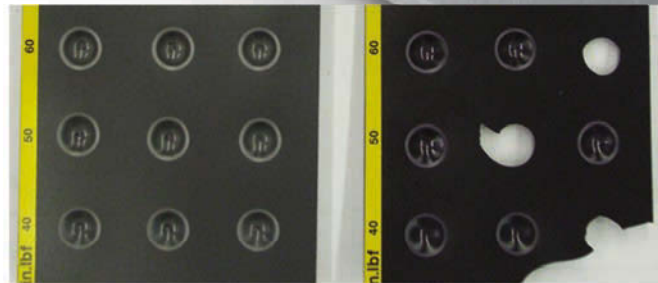
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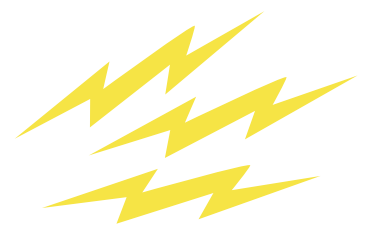
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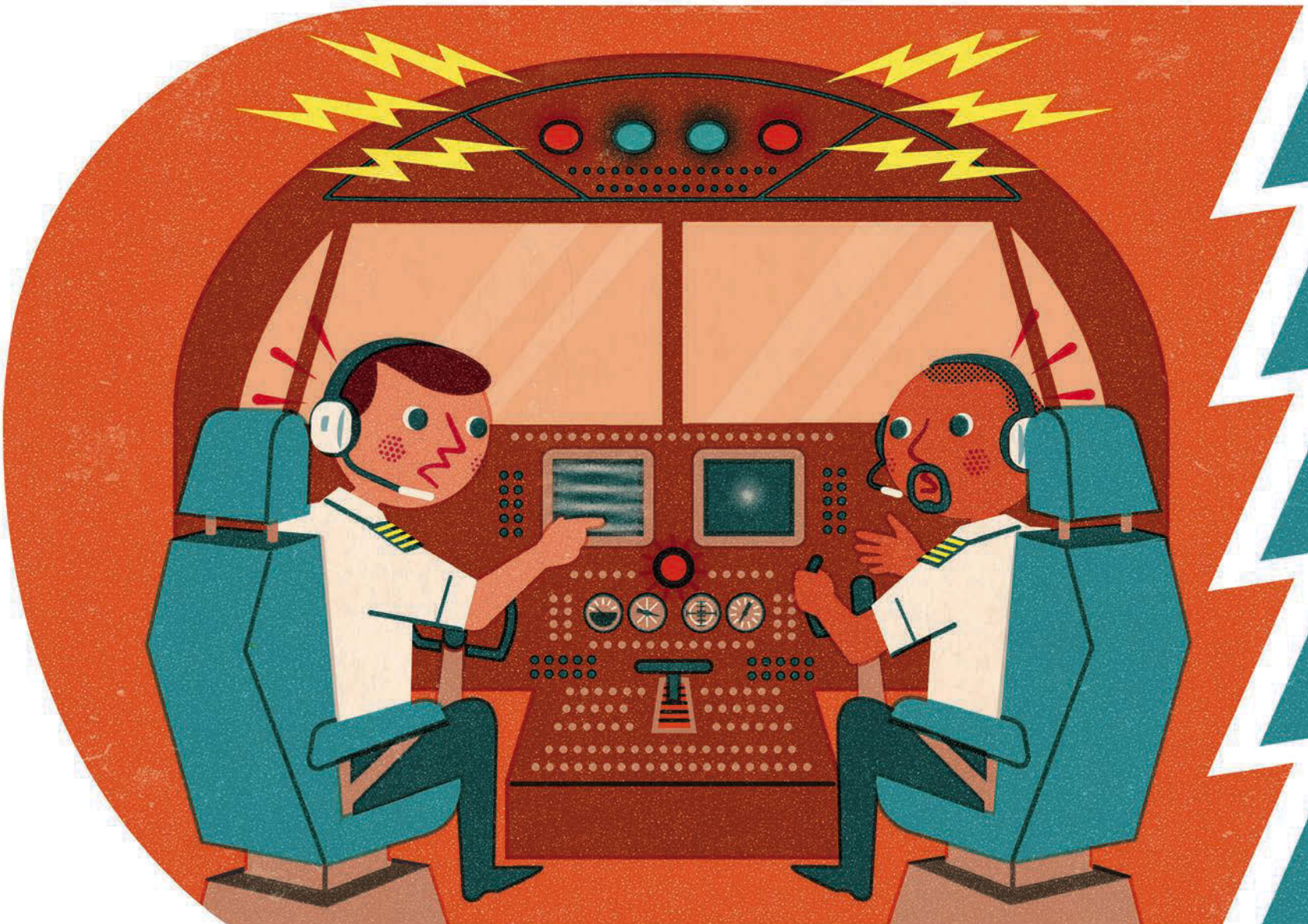
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# personaleffects



The FAA has recommended a process to safely expand the use of PEDs in flight. But will it be impossible to control usage on aircraft that haven't been made PED-tolerant? And will the abrupt switch in stowage policies compromise cabin safety?

MICHAEL CHILDERS



As a result of new guidance from the US FAA, 95% of US airline passengers have been able to use their small personal electronic devices (PEDs) during all phases of flight since the end of 2013 – ostensibly from gate to gate, although that term overlooks important PED stowage issues. By early 2014 Europe had begun to follow suit.

British Airways became the first European carrier to extend its PED use policy in December 2013, and on 1 January 2014, Lufthansa German Airlines began allowing expanded use of PEDs on B747-8s and expects to roll out this policy on all fleets once additional guidance from the European Union's Aviation Safety Agency (EASA) becomes available. By one estimate, more than 50% of European legacy airlines will accept EASA's guidance in 2014 in order to expand PED use.

According to Timothy Shaver, branch manager of the avionics maintenance branch of the FAA, speaking on a panel at this year's Consumer Electronics Show in January, within six weeks of the FAA's announcement of new

guidance on 31 October 2013, more than 60% of US airlines, representing 86% of the USA's 'large carrier' fleet and carrying 95% of US passengers, had determined via testing approved by the FAA that their aircraft were 'PED tolerant'.

Previously most airlines prohibited the use of such devices below 10,000ft to prevent emissions interfering with aircraft communications and navigation systems. But the recommendations of a 28-member panel of industry experts and stakeholders assembled by the FAA laid the groundwork for a risk assessment and mitigation process to make aircraft resistant to the emissions, allowing a considered measure of expansion of onboard PED use.

But extending PED use to all phases of flight raised questions about stowage rules during the extended usage period – making this not just an electromagnetic emissions issue.

Following the announcement by the FAA that it had determined that PED use could be safely expanded to all phases of flight on PED-tolerant certified aircraft, a frenzy

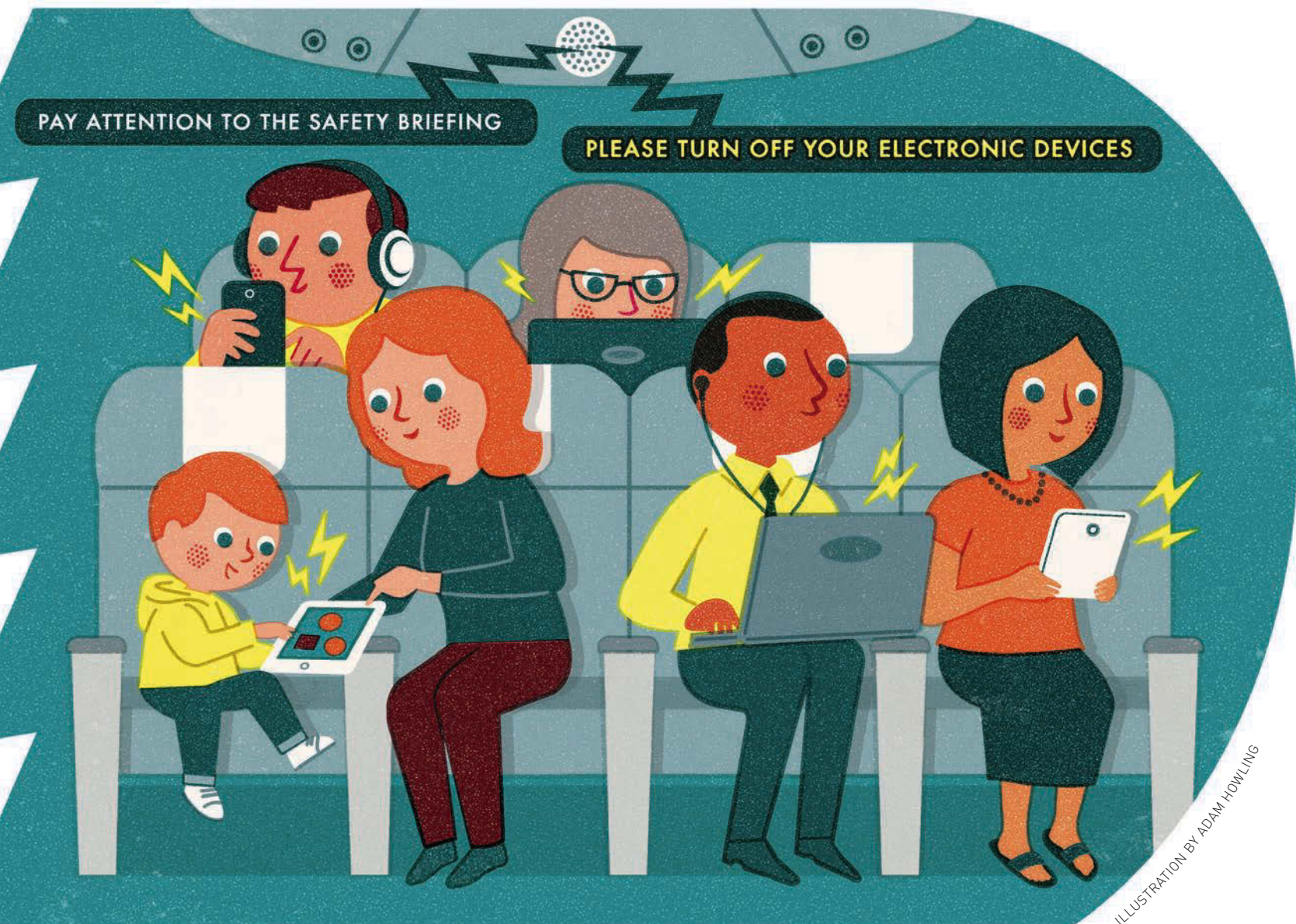


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BILL DEGROH, AIRLINE PILOT

of media reporting implied that passengers who had defied the 10,000ft rule had been vindicated, that the FAA had reversed its policy, and that some pilots and flight attendants were thrilled at the news. The clear implication of the majority of the press coverage was that emissions from PEDs had never represented a threat to flight safety.

But much of that coverage told only half of the story. I know because I was one of the 28 members of the FAA's PED Aviation Rulemaking Committee (ARC), assembled in February 2013, which recommended to the FAA that PED use could be expanded only on aircraft that underwent specified risk assessment and mitigation processes. The extended use allowance introduced new risks associated with unsecured PEDs becoming projectiles during some flight conditions and rare but foreseeable accidents. These risks were fitfully referenced in the media and inadequately considered by the FAA, in the view of some ARC members.

What the public might never know from reading most of these press reports is that their understanding of this issue is based on a number of common myths. The FAA's own 31 October 2013 press release – though technically accurate – capitulated in large measure to the mythology and failed to assert the validity of its own earlier guidance, some ARC members believe.

## flight attendants' concerns

According to Dinkar Mokadam, Occupational Safety and Health Administration specialist with the Association of Flight Attendants, and a CWA and PED ARC member, cabin crew are concerned with the potential effects of expanded PED use policies on cabin safety.

"For example," says Mokadam, "passengers may be distracted from hearing safety announcements when wearing headphones that are connected to personal music or video players. In addition, proper stowage of passenger items is always important, but especially critical during take-off and landing, when any sudden stop can toss unsecured items about the cabin, striking occupants or tripping them as they attempt to evacuate the aircraft."

"In fact, researchers from the FAA's Civil Aeromedical Institute, in a memo that is part of the final ARC report, said that use of PEDs "should continue to respect the clean cabin environment during the preflight briefing and critical phases of flight... It seems inexplicable to promote PED usage during the very times when passengers might need to engage that safety information the most." The memo also notes that: "Hanging onto a small object ... during turbulence or an emergency landing is possible, [but] it is the unexpected nature of these events that makes it more likely that a passenger would lose control of even a light object."

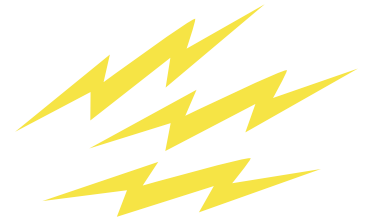
The memo continues: "The FAA and industry must address these issues clearly and unambiguously, and assure the public that neither aviation safety nor cabin safety will be compromised as expanded PED use policies are phased in."

One blog site devoted to gadgets hailed: "Victory! You don't have to shut off your electronics on flights anymore!" Calling the FAA rules "ill-conceived" and "blind terror", the article spent six paragraphs doing a victory dance before finally acknowledging that airlines still have to prove to the FAA that their aircraft are safe from PED emissions that could interfere with aircraft communications and navigation systems.

The *Kansas City Star* – my local newspaper – proclaimed that "travellers applaud reversal of the take-off and landing prohibition" and all but stated that passengers who ignored the rules had been right to do so all along. The opinion of a passenger that the rules were "silly" was put on the front page of the newspaper, but the actual findings of our committee were not part of its coverage – despite my having offered an article that gave the full story. The *Star* printed the statement of a US senator from Missouri who dismissed the ARC's eight months of work by saying that relaxing the rule was only "common sense".

And the usually reliable *New York Times* stated that the FAA report "won unusually broad praise from pilots [and] flight attendants". But if pilots and flight attendants praised some aspects of the report, many remain very concerned about other parts of the FAA action, including the fact that the FAA approach – though supported by a

PAY ATTENTION TO THE SAFETY BRIEFING



## pilots' concerns

Not all aircraft in the existing fleet have been shown to be in compliance with RTCA DO-307, Aircraft Design and Certification for PED Tolerance. Under certain low-visibility weather conditions this problem was determined to be an unacceptable risk.

One means to address this risk is to require the flight crew to make a safety announcement, asking passengers to turn off their PEDs when landing in certain low-visibility weather conditions. Pilots represented on the ARC are not aware of serious interference problems on the existing fleet of aircraft since the use of PEDs has been expanded. But pilots do not believe that the practice of some operators, which requires asking passengers to turn off their PEDs under these conditions, is a practical solution, and that the issue should continue to be discussed.

Pilots also continue to have concerns regarding passengers' ability to hold on to a PED during take-off and landing. Although unusual, runway excursions do occur and unsecured inflexible objects such as smartphones and tablets could become hazardous projectiles.



THE CELLULAR TRANSMISSION ISSUE IS NEXT, AND THE AIRLINE COMMUNITY IS READY TO SUPPORT CONNECTIVITY AND LET THE MARKETPLACE DECIDE

KIRK THORNBURG, DELTA AIR LINES

majority of ARC members – does not include a requirement for risk-based assessment and testing of all currently untested aircraft by a specific date.

In addition, many pilots and flight attendants object to the use of the term 'gate-to-gate' to describe the period when passengers may actually use PEDs on board PED-tolerant aircraft. Though devices may be left switched on in 'airplane mode' from gate to gate, PEDs are potentially dangerous projectiles during the take-off and landing stages if not stowed or secured (see *Flight Attendants' Concerns*, page 125).

**CORRECTING THE RECORD** Let's more completely and accurately report what the ARC found in its eight months of comprehensive study. We heard compelling arguments that many newer aircraft, manufactured to the specifications of a document called DO-307, which was prepared by RCTA at the behest of the FAA more than five years ago, were most likely 'PED tolerant' – a term we used to indicate that an aircraft was designed or retrofitted to prevent harmful emissions from PEDs from affecting aircraft communication and navigation systems. And we also heard persuasive arguments that aircraft that had been reconfigured for onboard wi-fi had, during that process, very likely been made somewhat PED tolerant.



**PLEASE TURN OFF YOUR ELECTRONIC DEVICES**

But we found no convincing evidence that proved to a certainty that aircraft that were not designed to be PED tolerant – many of which are still flying – or had not been retrofitted for onboard wi-fi, were completely safe from harmful PED emissions. We did not find, nor did we recommend, that it was safe for airlines to permit PED use on board aircraft without undergoing risk management and mitigation procedures.

The new guidance issued by the FAA did not reverse any rules or regulations protecting aircraft from harmful PED emissions. In fact, had an airline undertaken the same risk assessment and mitigation processes that were the subject of the new guidance, and declared to the FAA at some time in the past five years with guidance available at that time that it believed its aircraft were PED tolerant, the likelihood is that its application for expanded PED use would have been approved.

What the new guidance did do was offer airlines a clear path to identifying and assessing risks from PED emissions, and to mitigating that risk through currently existing aircraft hardening procedures, particularly RTCA DO-307. The "biggest shift in direction" due to the ARC's activity was that "we no longer evaluate each of the threats", said the FAA's Shaver. "We evaluate the capability of the aircraft to be tolerant to those threats. We've moved from device data to aircraft data."

Speaking along with Shaver on the CES panel, organised by the Consumer Electronics Association (CEA) and the Airline Passenger Experience Association (APEX), Kirk Thornburg, MD for engineering quality, technology and training at Delta Air Lines, who served as the ARC chair, was asked whether the ARC determined that there is

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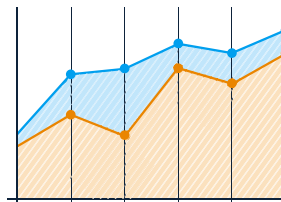
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no PED interference with aircraft communications and navigation systems. “No,” he replied definitively.

Responding to the same question, Shaver acknowledged that the potential for interference “is unknown” with regard to untested aircraft. “Data only comes from testing the aircraft,” he said, reinforcing the ARC’s finding that threat assessment was difficult due to the number of variables.

“The way to go is to harden the aircraft against emissions,” said Bill DeGroh, chairman of the Aircraft Design and Operations Group at the Air Line Pilots Association, International (ALPA), during the panel discussion, and affirming an important conclusion of the ARC.

Why shouldn’t we let passengers, politicians and non-believers in the earlier restriction guidelines enjoy their ‘victory’? Because all the reporting that suggests that passengers who ignore the rules are vindicated in their unscientific opinions will almost certainly result in many more passengers ignoring the important fact that there are still many aircraft flying today that were not designed to PED tolerant guidelines, have not been retrofitted via processes that reduce such risks, and have not – and maybe will not – undergo the current risk assessment and mitigation procedures.

And while the first airlines in the US to announce expanded PED use qualified their aircraft for all phases of flight, at least one US airline that is expanding PED use will forego DO-307 testing and ask passengers to turn off their PEDs if poor visibility requires a CAT II or CAT III landing. The credibility of those announcements is essential to achieving passenger compliance levels that will assure flight safety.

The earlier restrictions will still apply to untested aircraft for good reason. And when an increasing number of passengers ignore the rules on those aircraft – or on an aircraft where use may vary according to flight conditions – a group of dissenting ARC members believes that an uncertain but very real risk exists that emissions from those PEDs could interfere with aircraft communications and navigation systems and jeopardise flight safety.

While there was consensus on the ARC with regard to most of its recommendations, five ARC members representing airline pilots, cabin crew, passenger groups, in-flight entertainment/communications providers and IT providers dissented on a key issue: whether airlines should be allowed to expand PED use incrementally by phase of flight versus being required to maintain the prior 10,000ft

## dispelling popular myths

### **The FAA established a policy that PEDs could not be used below 10,000ft**

**FALSE:** The FAA merely provided guidance that said that airlines were responsible for determining whether their aircraft were PED tolerant below 10,000ft, i.e., that their aircraft were configured to prevent PED emissions from interfering with aircraft communication and navigation systems during take-off and landing. The FAA provides the guidance, the airlines create the policy, and the flight crews are charged with enforcing it.

### **The FAA reversed its prior rules on emissions**

**FALSE:** No rules involving PED emissions were changed in the FAA’s 31 October 2013 announcement of new guidance. In fact, had an airline undertaken the same risk assessment and mitigation processes that were the subject of the new guidance, and declared to the FAA at some time in the past five years with guidance available at that time that it believed its aircraft were PED tolerant, the likelihood is that its application for expanded PED use would have been approved. What changed in the FAA guidance was that it set out a more specific path by which airlines could undertake risk assessment and mitigation procedures, and PED stowage rules were relaxed.

### **The PED ARC and FAA concluded that PED emissions represent no flight safety risk**

**FALSE:** In fact, the ARC’s recommendations and the FAA’s new guidance require that an airline undertake risk assessment and mitigation procedures to ensure that their aircraft are PED tolerant before allowing the use of PEDs. What was not in the FAA press release was that the ARC also recommended that aircraft manufacturers should ensure that new aircraft be designed to the specifications of RTCA DO-307 to ensure that the aircraft are safe from such harmful emissions.

### **Rules prohibit the use of wi-fi below 10,000ft**

**FALSE:** The majority of aircraft in the US that are equipped with onboard wi-fi for connectivity use an air-to-ground (ATG) system. At the time this system was designed, airlines were observing a policy of no PED use below 10,000ft. Hence the wi-fi system was designed around this restriction. When the PED restriction goes away, only the design of the ATG system stands as a barrier, and it is rumoured that the largest provider of wi-fi connectivity on US aircraft is considering reconfiguring the design of its system to take advantage of the longer use opportunity.

### **PEDs may be used gate-to-gate**

**FALSE:** This term is misleading. While PEDs may be left on in airplane mode from gate to gate on approved aircraft, many PEDs – such as large laptops – may still need to be stowed during take-off and landing due to their potential to be dangerous projectiles under certain conditions. Smaller devices need to be secured “in-hand”.

## an IFE company viewpoint

Crew announcements are not effective risk mitigation, says Rich Salter, CTO of Lumexis, and an FAA PED ARC member. “The PED ARC dissenters group [which included Salter and author Michael Childers] was particularly concerned about the ARC majority’s opinion that having the crew make an announcement to switch off PEDs was effective risk mitigation.

“Further, even more concerning was that the ‘turn off PEDs’ announcement would be even less effective and lacking in perceived credibility in the future, as some airlines begin to allow expanded PED use. Passengers will choose to ignore the announcement, thinking that some airlines are allowing gate-to-gate use, so it must be safe on all airlines. According to some airlines’ public documentation on this subject, safety is everyone’s responsibility, but this is simply not the case, since the safety of the aircraft is the responsibility of the operator – the airline and ultimately the pilot. However, there is no practical way for the crew to verify that passengers have turned off their PEDs. Therefore, asking passengers to turn off PEDs during a critical CAT II or III landing is not enough.

“For this reason the dissenters group believed that it was essential that we minimise the period when we would allow the safety of the aircraft to be in the hands of passengers and rely on them to turn their PEDs off when instructed. We recommended that all legacy aircraft be shown to be PED tolerant by January 2017. In part this date was chosen to be not long after the date that we believed all newly manufactured aircraft would be mandated to be PED tolerant, but this begs the question of when the FAA act will on the remainder of the ARC’s 29 recommendations, including the date for all newly manufactured aircraft to be PED tolerant.”



WE NO LONGER EVALUATE EACH OF THE THREATS. WE EVALUATE THE CAPABILITY OF THE AIRCRAFT TO BE TOLERANT TO THOSE THREATS. WE’VE MOVED FROM DEVICE DATA TO AIRCRAFT DATA

TIMOTHY SHAVER, FAA



limitation until the aircraft is determined to be PED-tolerant from gate-to-gate, and that all aircraft be tested by a certain date.

Representatives of ALPA, the Association of Flight Attendants-CWA, the National Association of Airline Passengers and APEX, though supportive of the expansion of PED use, were concerned that allowing incremental expansion by phase of flight would be confusing and would lead to increased non-compliance in situations where aircraft were not PED-tolerant gate-to-gate, particularly in the case of instrument landings in CAT II and CAT III conditions.

The dissenters believed that the industry should transition all its aircraft fleets as rapidly as possible to full PED tolerance, and also felt that risks to cabin occupant safety that would result from changes to PED stowage policies should be assessed proactively and mitigated as deemed necessary.

**A HISTORY OF PASSENGER PUSHBACK** For years, as travellers have become increasingly attached to their PEDs, they have pushed back against policies that required passengers to turn off and stow PEDs and other kinds of portable electronic equipment except when flying above 10,000ft. Either as part of the pushback – or just plain bad memories – nearly 30% of respondents to a poll taken in 2013 by APEX and the CEA admitted to leaving such devices on at least once during forbidden phases of flight.

The fact that as many as 30% of passengers may intermittently violate these rules – without any catastrophic incidents – has caused a lot of people to believe that such rules were unnecessary.

Flight attendant announcements of the newly changed airline policies were initially ambiguous and confusing – due to the abrupt change in FAA and airline policy and through no fault of the flight attendants themselves. Within a few weeks, most of the announcements I heard said that any smaller device could be left on if it was in ‘airplane mode’.

But many passengers were unaware whether their devices had such a function, and if they did, how it was turned on and off. And in my experience, many flight attendants were unaware that numerous devices compliant with the recommendations do not have this mode. The primary function of ‘airplane mode’ is to turn off the mobile phone connection to enable compliance with the FCC’s policy against inflight phone use – now also being reviewed. Airplane mode shuts down mobile connections, wi-fi and Bluetooth, and after activating this mode, the wi-fi function has to be turned back on separately to establish a connection.

# An open letter to passenger airlines:

17 March 2014

We've been through a lot together, you and us. We've seen this industry shift and change over the years. We've witnessed suppliers and airlines come and go. We've made good friends and miss the ones no longer here. And what have we learned?

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## EASA updates guidance on PEDs

On 9 December 2013, EASA announced that it had updated its guidance on the use of PEDs on board, including smartphones, tablets and e-readers. Using the term 'flight mode' rather than 'airplane mode', EASA said that these devices "may be kept on in flight mode (non-transmitting mode) throughout the journey (including taxiing, take-off and landing) without a risk to safety". British Airways extended PED use in December 2013, and on 1 January 2014 Lufthansa extended PED use on its B747-8s, with plans to extend fleet-wide gate-to-gate PED use upon further guidance from EASA.

"We all like to stay connected while we are travelling," says European Commissioner for Transport, and vice president of the European Commission, Siim Kallas. "But safety is the key word here. I have asked for a review based on a clear principle: if it is not safe it should not be allowed, but if it is safe, it can be used within the rules.

"We are taking a first step to safely expand the use of inflight electronics during taxiing, take-off and landing. Next we want to look at how to connect to the network while on board," he adds. "The review will take time and it must be evidence led."

Kallas predicts that new EU guidance on the use of transmitting devices on board EU carriers will be issued early in 2014. By one estimate, at least 50% of European legacy carriers will accept EASA's guidance in 2014.



With respect to passenger distraction from the use of PEDs during safety briefings, or risks to occupant safety from smaller PEDs that are not stowed in approved locations, some of the dissenting ARC members believe there has been scant evidence of concern on the part of the FAA or the airlines. With the 31 October 2013 announcement, the FAA noted that passengers should "secure" devices "in-hand" during take-off and landing. While this guidance is at best problematic (see again *Flight Attendants' Concerns* on page 125), on every flight I have flown since late November, cabin crew, following their airline's policies, are not making even this minimal suggestion to passengers.

During the panel discussion in Las Vegas in January, the FAA acknowledged that it is still monitoring PED stowage policy. It would come as no surprise to many if that policy were strengthened in the future.

Captain Chuck Cook, manager of fleet programmes and technology at JetBlue Airways, an ARC member and CES panellist, also acknowledged that communication regarding PED use and stowage policy was likely in need of improvement, and Delta's Thornburg said that airlines are trying to harmonise stowage policies, most likely through airline forums such as A4A. This may represent both a challenge and an opportunity for seat manufacturers to address designs to better accommodate stowage with arms-length access for PEDs.

**A BETTER PASSENGER EXPERIENCE** Considerations of flight safety aside, the increased use of PEDs on board aircraft will be beneficial to the passenger experience, as well

as to providers of onboard connectivity and entertainment that depends on passenger devices. It means that providers of ATG connectivity – if they reconfigure their systems – providers of satellite connectivity, and providers of wi-fi streamed content to passenger devices can offer their services almost from the moment a passenger is seated until the aircraft is at the arrival gate.

Those whose window of opportunity for such services was constrained by the loss of 15 or 20 minutes at the beginning and end of the flight may now continue the services gate-to-gate, excluding brief periods of stowage. On shorter flights this may make the difference between passengers buying or not buying the service.

And as for the safety issue – as important as it is – if the FAA follows all 29 of the recommendations and requires aircraft manufacturers to immediately begin designing aircraft to be PED-tolerant, non-compliant aircraft will be replaced over time by aircraft designed to withstand PED emissions. In the interim, however, passenger non-compliance will likely increase, and the risks from that may increase proportionally.

What's next? Removing the 1991 US Federal Communications Commission (FCC) Part 22 800MHz rule, adopted to protect cell towers on the ground, and instead using pico-cell technology to protect the ground network, would make it possible to access text, SMS and email, according to Julius Knapp, chief of the FCC's office of engineering and technology.

"The cellular transmission issue is next," acknowledges Delta's Thornburg, "and the airline community is ready to support connectivity and let the marketplace decide." ☒

Michael Childers has over 30 years of experience in the IFE sector and is chairman of the APEX Technology Committee. He also contributes to this magazine as an independent journalist.



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01. American's new B777 business class, designed in conjunction with JPA Design



# modernmanners

As one of the industry's most ambitious interiors programmes ever, the airline industry is eagerly watching the New American evolve. Meet Alice Liu who, as managing director of onboard product and connectivity, is one of the lynchpins of this dramatic development

MARISA GARCIA



Set against the backdrop of record activity in new aircraft interiors programmes, including a push from low-cost carriers who are improving their product offering by introducing features such as fully flat seats, enhanced IFE and connectivity services, American Airlines has initiated one of the most ambitious aircraft interiors programmes the airline industry has ever seen.

Having to compete with all of this activity should be enough to unsettle anyone in the top job of aircraft interior management at American. Adding to the pressure were the financial troubles that threatened to drive the airline into bankruptcy, until it was saved by US government approval of the American Airlines/US Airways merger.

Alice J Liu, managing director of onboard products and connectivity at American, appears impervious to this pressure, replying to questions with the grace and calm indicative of a professional who has things under control.



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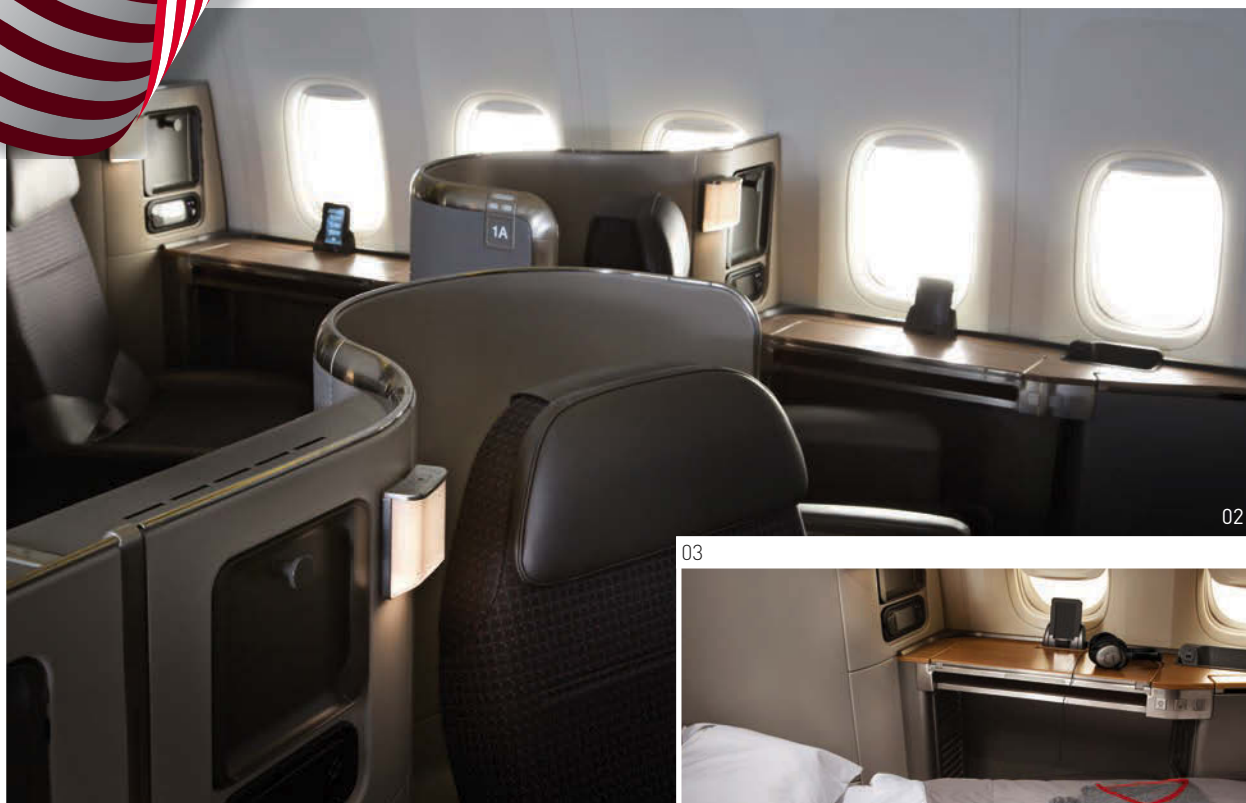
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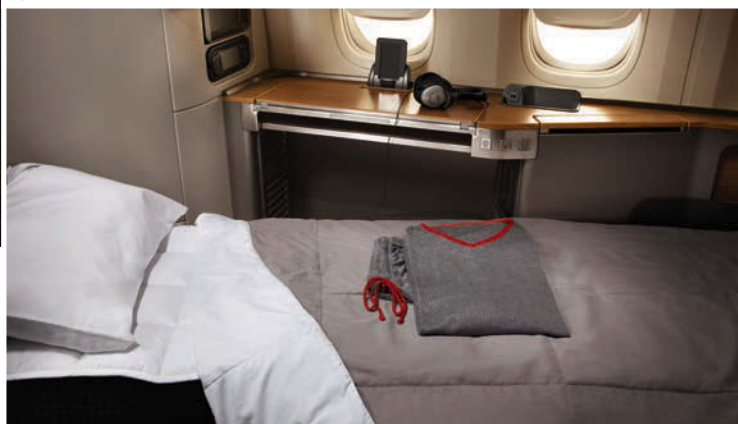
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02

03



Liu is a relative newcomer to the field of aircraft interiors, having taken up her current role at American Airlines in 2010. She holds a Master of Accounting degree and a BA in Business Administration from The University of Texas at Austin's McCombs School of Business, and worked as a corporate auditor at Ernst & Young prior to joining American Airlines in 1998. Since joining the airline, she has held leadership positions in finance, sales, inflight dining and procurement, bringing her closer to the cabin interior with each new assignment. She has put the experience gained from each of those functional areas to work for her in this new role.

When speaking with Liu, one is overcome by the calm and confidence with which she addresses questions on the logistics and challenges of managing the world's largest aircraft interiors programme. While acknowledging that the fleet renewal programme for American Airlines was already ambitious before the merger, she credits her in-house team – senior manager of onboard product planning and design Steven Moo-Young, senior manager of in-flight entertainment and connectivity Brian Richardson, and design manager Brandy Byrnes – and the company JPA Design for making it possible.

"In designing our new fleet," she says, "we wanted to move away from how an airline historically designed airline interiors. We want the aircraft interior to look and feel like an environment that our customers interact with every day on the ground."

American Airlines, she tells us, wanted the aircraft interior to reflect the carrier's overall aim of having the most modern and efficient fleet in the world. "We were 100% focused on modernising our product," she says.

**MAKE YOURSELF AT HOME** The fleet consists of more than 1,500 aircraft serving nearly 200 million customers. Liu tells us that, in order to satisfy a wide-ranging passenger mix, American performed comprehensive customer focus groups and surveys. The design inspiration came from an in-depth study of global hospitality trends. For American Airlines' passengers, she tells us, "The aircraft cabin is their living room, dining room, office and bedroom." American wants to provide its passengers with an experience comparable with what they would enjoy at a high-end hotel and restaurant.

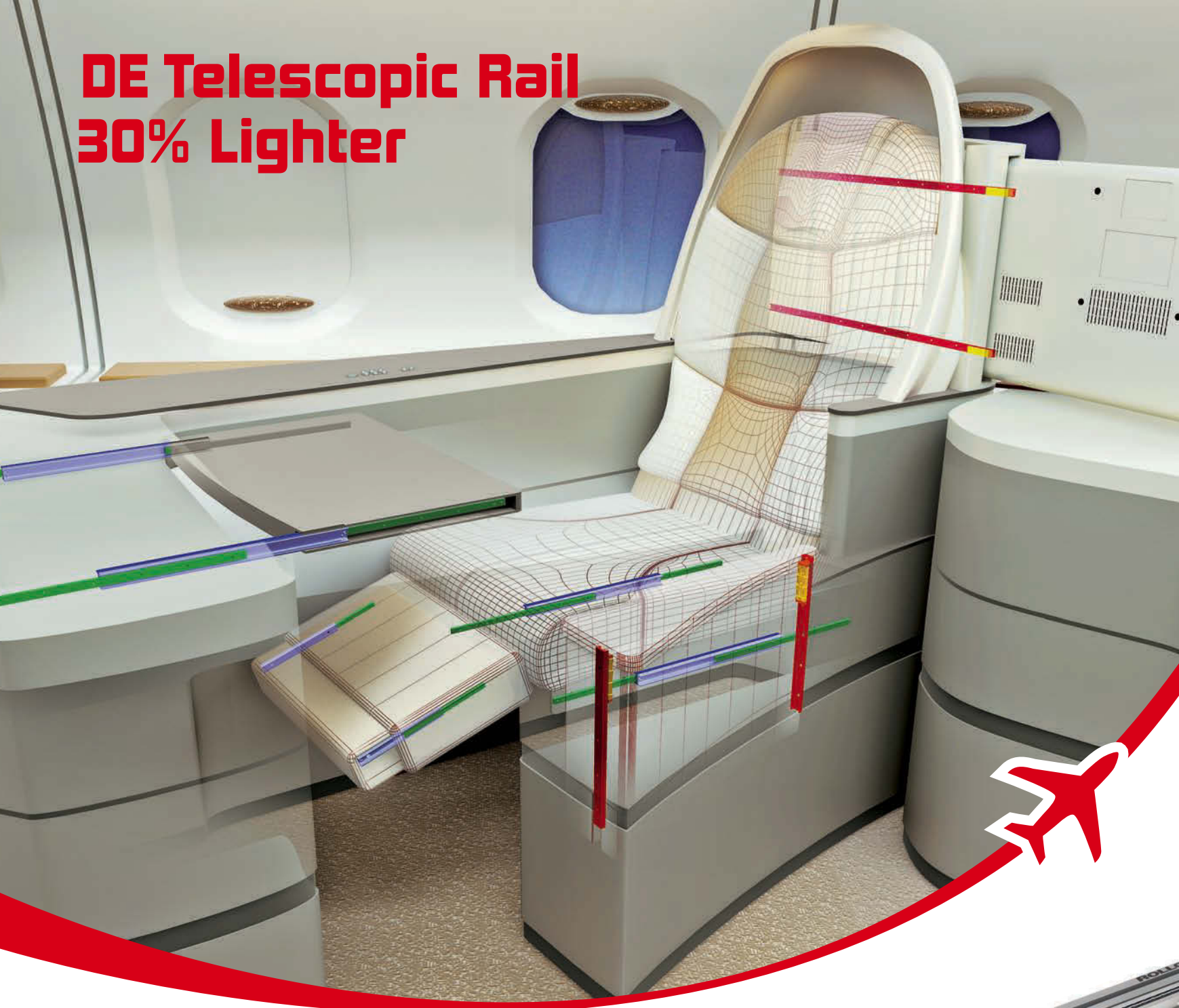
Beyond redesigning its seats and loading them with convenient ports for electronic devices and numerous comfort features, American Airlines performed a comprehensive redesign of the cabin environment.

For example, a new walk-up bar was introduced in place of the traditional galley at the entrance of its B777-300ER aircraft. American "took a step back", Liu tells us, to analyse the passenger cabin experience from the start of the journey. Referencing an inspiration from the hospitality field, she says "you don't walk through the kitchen" to be seated at your table at a fine-dining restaurant.

A "soothing modern environment" is further enhanced by cabin features such as a dome ceiling, unique "starry skies", and premium lavatories equipped with luxury amenities and wooden floors. Liu tells us that American

02. The Contour (now Zodiac) Flagship Suite was selected for the B777-300 first-class cabin
03. The first-class seat offers a 36in seat width, 64in pitch, and an 80in-long bed

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Airlines worked closely with Boeing to develop interiors products that would be a complete departure from previous cabin designs, while ensuring certification and deliverability.

The programme targets are well defined. As Liu says, “In addition to taking delivery of new aircraft, as part of American’s fleet renewal initiative, we plan to refresh a majority of our existing fleet’s interiors to ensure a consistent customer experience. In fact, our B737-800 and B757 domestic aircraft have recently undergone a refresh. And we will begin to retrofit our B777-200ERs with fully lie-flat business seats, all with aisle access, Main Cabin Extra seating, wi-fi, and state-of-the-art in-seat IFE systems throughout the aircraft. In addition to the B777-200 retrofit, we will also begin retrofitting up to half of our B767-300ER fleet with fully lie-flat business seats with all-aisle access and Main Cabin Extra seating. We anticipate these retrofits to be completed within a couple of years.”

Close coordination and monitoring of the process is critical to keep up with an aggressive delivery schedule. American sees one new aircraft delivered each week. Liu and her in-house team closely monitor supplier performance, ensure supplier compliance, track issues, and keep materials and component deliveries in line with the programme’s targets.

Liu acknowledges that even the best-planned programmes can run into trouble. When we ask about plans to maintain the ‘freshness’ of the interiors, she says that one of the issues that might prompt them to change an onboard product is the “changing capabilities” of their suppliers. While certain design elements are good in concept, and even satisfactorily delivered on new aircraft, she recognises that as the programme develops, some

“

WE EVALUATED PRODUCT TRENDS TO  
SEE WHAT CUSTOMERS REALLY WANT ”

changes may be required. Certain minor alterations may appear in the cabin, accommodating limitations identified during programme completion, and in service.

She also points out that American would consider incorporating any new cabin innovations that may become available on the market during the time between aircraft ordering and delivery. However, this statement does come with the caveat that any such changes would have to be justified by criteria such as enhancing the passenger experience, resolving challenges of the cabin discovered in service, or providing significant benefit to the durability and ease of maintenance of aircraft interiors.

**THAT’S ENTERTAINMENT** As an example of a product that tested their abilities, she references the development of the IFE product. American has placed great stock in the ability of its IFE offering to differentiate the brand.

“We evaluated consumer product trends to identify what our customers would really want to see. We kept in mind a system that had modern aesthetics, but was functionally intuitive to use. The result was a design that allows for effortless navigation, while at the same time customising the experience for each customer on board. The home screen allows customers to choose from libraries of movies, television shows and audio selections, while

04. The entranceway of the new 777 fleet doubles as a stylish bar area



05



06



07

- 05. Economy class in the B777s, with blue seats, recalls a little more of the old American style
- 06. As something of a rookie in the cabin department, Liu has done an incredible job
- 07. After some initial reservations, the public is really warming to the bold new livery

also providing the ability to customise settings to their preferences, including the choice of 14 languages.” Rather than focus on hardware alone, American feels the best way to satisfy its customers is to ensure a wide range of content. Liu tells us that they will offer sufficient content for their passengers to “fly around the globe 15 times without consuming the same thing twice”.

The airline offers the same interface and applies the same features throughout its Boeing and Airbus fleet, and across all classes of service. It has also chosen to offer premium customers the use of Samsung tablets on selected flights, and is providing international satellite wi-fi. “The result is a successful and consistent product on our new fleets, and one that our team is very proud of,” Liu says.

**FOOD FOR THOUGHT** Liu’s experience of coordinating inflight dining shines through as she emphasises the careful selection of dishes and flatware, which American selected to coordinate with the cabin interior designs. Pointing to the importance of “life not interrupted”, she tells us that in order to ensure a consistent pleasant onboard experience, the dining aspect requires equal attention. To ensure this, American is introducing new menus and implementing “a service level intended to be more like a restaurant” than an airline.

To be sure that this service level can be maintained, and that the cabin design also meets the needs of the cabin crew, American Airlines involved its Flight Service team in the cabin design process. “While at work, they observe the everyday,” she tells us, highlighting the importance of the comments and insights that the flight crew gather on the functionality of the interior design and how best to meet

the objectives of the new inflight service standards. “We took into account feedback from our customers and employees alike on what elements should be incorporated into our interior designs.”

**PERFECT HARMONY?** When we come to the big question of harmonising the US Airways fleet, however, Liu is more cautious. She assures us that there is a strategy of harmonisation and that American will decide “what makes sense to touch” and what should remain. “As the new American takes shape throughout our integration process,” she says, “we’ll share more details on how we’ll harmonise our fleets to achieve a more consistent customer experience across our carriers.”

With the volumes of equipment and materials that American will purchase and install, and the corresponding purchasing power that those volumes will bring to the Oneworld alliance, the decisions that the ‘New American’ makes hereon could define the aircraft interiors trends for the entire industry, if for no other reason than suppliers will be tasked with keeping up with massive volumes and pushing the envelopes of both their capabilities and capacities. The New American will be a highly magnified testing ground for what works and what doesn’t. At such an aggressive rate of delivery, we’ll know very soon how this plays out. We’ve seen “world’s largest” applied to airlines before, but this latest “world’s largest” is one to keep a very close eye on.

We’re left with the clear impression that Liu already has her sights firmly focused on ensuring the success of this mega-endeavour, and she tells us she is “incredibly excited” about American’s prospects. ☒





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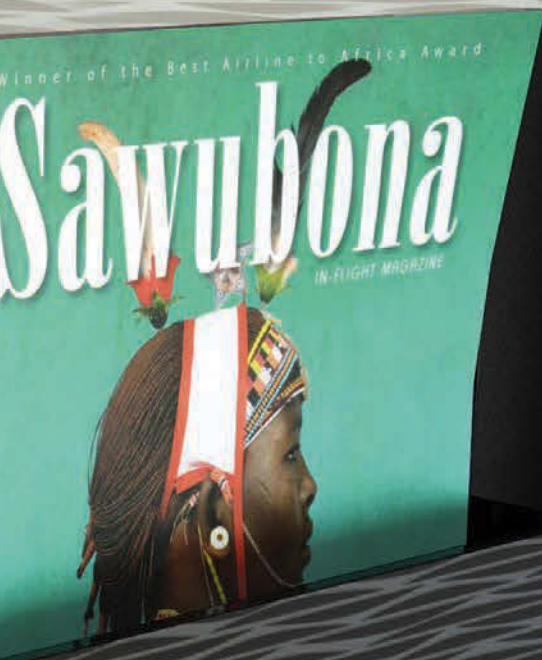
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# singleminded

South African Airways' new A320 interiors mark the beginning of a fleet-wide revamp that brings together the entire continent

ADAM GAVINE

01. The anthracite panels are simple and striking, but proved a challenge during the project

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02



With an order for 12 A320s in place, it was a good time for South African Airways (SAA) to look to introduce greater fleet consistency – and a new look. However, it was also a short time – just 15 months until the first on-dock date. A choice presented itself: stick with existing suppliers, do some in-house CMF work, and have a quick and simple project; or go further and bring in a design house, new suppliers and a new cabin design? SAA chose the latter, which now forms the basis, not just of its narrow-body interiors, but its future wide-body designs too.

The A320 seats are all sourced from Geven. In such a short timescale, selecting a new seat supplier was a bold move, but it was a matter of necessity. The usual catalogue choices were gradually crossed off the list as they were deemed unsuitable, too expensive, or not available for delivery by the deadline. However, the flexibility that many smaller seating companies can offer proved useful, and Geven presented a solution that would meet the airline's cabin requirements, and its cost and time constraints. That doesn't mean a straightforward project lay ahead though. Far from it in fact, especially since the business class seat hadn't been certified yet.

The seat in question, the Comoda, was launched at Aircraft Interiors Expo 2012, billed as an extra comfortable single-aisle business seat, weighing in at 21kg per pax place. (Indeed 'comoda' is Italian for 'comfortable'.)



IN SUCH A SHORT TIMESCALE, SELECTING A NEW SEAT SUPPLIER WAS A BOLD MOVE



However, the design house SAA brought in – Priestmangoode – wanted to make some modifications to the standard Comoda product to enhance the styling and privacy, and add a few more features. Leveraging the muscle of SAA, Priestmangoode succeeded in negotiating some substantial customisation of the seat, while the SAA team, led by Myriam Bracke, executive manager of product development, also flexed a little muscle at Airbus to convince them the seat would be ready for the on-dock date – while also pushing back that date a little. As Bracke says, “We had to a lot of pushing, pulling and negotiating.”

While the Comoda seat wasn't certified, at the time SAA got in touch with Geven, the engineering work had progressed to the point of being ready for certification. “We came in at the end of the engineering phase and wanted to change a lot of items, but hats off to them, they accommodated 60-70% of it,” says Luke Hawes, director at Priestmangoode.

02. The printed reveal behind the headrest really stands out from the earth tones



03. The rear magazine rack. So simple, yet so much work

04. There is great design consistency in the cabin between business and economy

The team left the major elements such as geometry and actuation as standard, but exerted their design influence on the shape of the backshell, centre console and end bays. Overall there was a general tightening of tolerances and split lines and some refinement of the backshell, including a tablet holder (see *IFE slots in*, right). Privacy was a big concern for the team as there was a large gap between the seats. This space was minimised, and the centre console was extended with bottle holders to further improve privacy. Some extra stowage space was also added for small items such as books and glasses, and the magazine stowages were expanded.

The main focus of the customisation work was the centre console. Priestmangoode was keen to alter the shape of this element for aesthetic reasons, and to add some efficiency to the design.

“The console is quite a story, particularly in the timeframe,” says Hawes. “There was some wasted space, so we flattened areas for cocktail tables, moved the sockets, added stowage, and scalloped the sides as much as possible to enhance comfort. Geven re-engineered the structure to put things where we wanted them.”

Thankfully the economy seats were a much simpler proposition, with the standard Geven Piuma chosen. Its

## IFE slots in

One of the major changes the team made to the Geven Comoda business seat was the addition of a small shelf in which a passenger’s tablet can be slotted to create a removable IFE solution. This setup saved project time, and also airline costs, as it cuts down on software issues, cabling and maintenance. To ensure the entertainment doesn’t go flat, a USB charging point is also incorporated.

SAA is also trialling a loan system of Samsung tablets on flights of over four hours to see how well the logistics work, and has put out a tender for IFE content distribution.

Myriam Bracke, executive manager of product development at SAA, explains the decisions they made on IFE for the A320s: “We did a business case on IFE, and giving power for all passengers is important. We have USB and PC power for each passenger in business class, and shared outlets in economy. We didn’t want embedded IFE due to the weight, and also the restrictions it brings. If you want to put in a couple more seats it becomes extremely difficult when you have embedded IFE systems. These A320s will fly everything from a short route of one hour from Johannesburg to Durban, to a four-hour route from Johannesburg to Kinshasa. To carry the extra weight on a Durban-Johannesburg route doesn’t make sense.”



THE MAIN FOCUS OF THE CUSTOMISATION WORK WAS THE CENTRE CONSOLE



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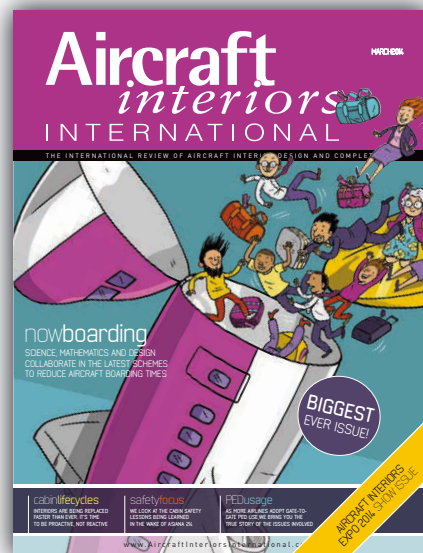
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05

trim and finish proved a little more challenging (more on this later).

**PANEL SHOW** A lot of attention was paid to items such as brand panels, the first of which – a proper enamelled 3D logo in the shape of the tailfin, not a print – is on an anthracite-coloured panel mounted on the side of the galley to greet passengers as they board. The band continues round to the front row, with an anthracite-coloured magazine rack featuring a burnt orange foil background, and a monitor with an anthracite surround.

Very simple and smart, especially with the silver wall featuring a linear weave design providing the backdrop, although finding a suitably dark monitor surround posed some difficulties, as did coordinating the monument supplier (AIM Aviation), the décor supplier and the monitor provider to work together and create a seamless look.

“What appears to be a lovely way of containing the function of the bulkhead with this anthracite band is actually quite complex. Visually it just looks nice, but to actually implement it with all the tolerances right is quite a thing,” explains Hawes. “The A320 catalogue is verging on the A350 catalogue in terms of being quite restrictive. If you’re trying to do something to bulkheads or monuments, it’s quite a challenge.”

However, that problem was a breeze compared with the panels at the rear of the cabin. These simple-looking metal panels, which run the full width of the walls at either side

## the future of seat design?



Reflecting on the design process of the Geven business seat, Luke Hawes, director of Priestmangoode, is pleased. “The whole notion of taking a vendor’s standard seat and challenging them to customise it as much as possible is a good way of working. In our work we have had the full spectrum, from a blank canvas in first and business class and being able

to do exactly what we want, to just picking a few colours and changing the leather. This middle ground of taking a standard product – usually certified and with a reliable kinematic – and challenging the vendor to make it as customised as can be, is a really rewarding process.

“If anything, you get more respect from a seat vendor who thought they had done the best they possibly could with a design, and you say ‘if you tweak this, it will totally change the look’. We just did this with another business seat and made a design that resembled an ice cream box into a piece of furniture in 12-15 months.

“I think it is totally the way forward for the industry. Only the big boys, the Cathays and the Lufthansas, will say ‘let’s do something truly innovative’. But it takes three times the amount of time, a minimum of three to five times the cost, and it brings huge problems, huge headaches and huge certification issues. The way we just worked with Geven is the way the industry is going to go.”



## THE SAA BRIEF WAS FOR THE CABIN TO BE 80% SOUTH AFRICA, 20% AFRICA

of the aisle, and again feature 3D logos and an acid-etched 3D textured linear weave, created difficulties for the team. The problem was that the magazine pockets that extend the full width of the panels, complete with acid-etched aluminium cladding, had to comply with the restriction of 5kg on the attachment point. Through a series of refinements, the team reached their design aim – again, an impressive feat, given the timeframe.

**A CONTINENT IN ONE CABIN** SAA is the flag bearer for the entire continent of Africa, something it wanted to reflect in the CME. This is no small task, given that Africa has 54 countries, nine territories and two states. Bracke’s brief of “80% South Africa, 20% Africa” narrowed the field a little, but as Hawes says, “South Africa alone gives us a huge variety of cultural cues to pick up on, and to then think of 20% Africa is quite a challenge. It is similar to when we had to capture the feel of South America for the TAM project [see *Welcome Home*, March 2013, p140-148; also available in our online archive], but I’d say this is at a bigger scale. I was astounded when I studied the map of Africa and saw the number of countries, all of which are very different. It’s mind-blowing. Africa is hugely rich in pattern and colour. We looked at a vast array of patterns from local

05. The Geven Comoda in standard form, prior to the customisation work



## HAVING AN ELEMENT OF SURPRISE WAS ALWAYS A BIG THING FOR US

06. All of Africa, from the ground to the sky, all in one A320 cabin
07. Elements from the new tailfin livery were brought into the cabin design

communities, including basket weaving, arts and crafts, and beadwork. It is all incredibly colourful and we had to extract some of that.”

The strict time pressures also helped to narrow choices, as the team had to use reasonably standard materials and processes, and limit complexity for vendors. Gold and anthracite were decided upon as the main colourways – partly because gold is an important part of South Africa's heritage – and that 20% of Africa was introduced in small but striking ways.

The gold curtains feature a subtle arrow pattern, which has been derived from Brand Union's recent work on revitalising the airline's livery, branding and touchpoints. A series of artworks was created that translates the main airline branding into secondary brand elements, of which the arrow pattern was one. Likewise, a subtle spear pattern is used on the decorative laminates. Less subtle is a statement artwork from Brand Union, which picks up the bright tailfin colours and features as a backdrop to the magazine pockets. This panel can be swapped out for other colours and patterns – to promote sporting events, for example.

The seats are all finished in a golden leather, which is a soothing tone as well as a depiction of sun and soil. Some initial work went into creating a textile for the business seats, but time pressures dictated leather. However,

## the wider view

SAA is seeking to achieve greater consistency across the passenger experience. Brand Union's rebranding work has tidied up elements such as the visual identity and brand assets, and the work done on the A320 cabins will also translate into the forthcoming new wide-body fleet. The colour palette will be carried over to the wide-bodies, although the business seats will be trimmed in fabric instead of leather. The carpet and curtains will also be used, as will some custom items such as the galley flooring, as well as the new service items.

While the exact models of wide-body aircraft due to enter the fleet aren't known yet, preliminary work is underway. Preferred seat types are being assessed, including a potential first class. Special attention is being paid to business class, as Bracke says: “We want a very good business class seat. We have a flat bed model now, but it is quite old. We also need to make sure we retain or extend the seat count, while enhancing the experience.”

Bracke indicates that the idea will be revisited for the wide-body fleet.

The business seats are enlivened by an embossed logo on the headrest, and feature stitch lines in a punchy orange that picks up on the arrow shape in the airline's logo. The statement artwork again appears, as a reveal between the headrest and seatback. The pattern in this fabric from Botany Weaving is block printed so it is exactly the same in each seat, and covers the entire background to the headrest, so the more the headrest is squeezed or the wings moved, the more colour is revealed.

“This took a massive amount of work to get right and I was really worried about it,” says Bracke. “We tried many options. Initially it was full colour, then we tried an embroidered fabric, but it ended up being very expensive. Having an element of surprise was always a big thing for us. We wanted a little something to ‘pop’ to the passenger.”

These efforts are also carried over to the economy seats, with the stitch lines in black, and the reveal in a vibrant blue. Further work, such as tightening tolerances and wrapping the leather further round the seat, also helped to make the Piuma's design their own.

One real extravagance was chosen: the blue light strips that run along the overhead bins. Not many airlines select this expensive Airbus option – Lufthansa is among the few, with its yellow strips – but SAA felt it added some interest to the passengers' view.

With an anthracite and gold carpet with a speckle, earth tones in the seats, and the blue strips overhead, the landscape and sky of Africa are represented, with its people and culture adding bright flashes. *Welkom!* ☒



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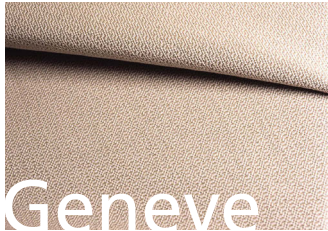
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# pleasurezone

Airport lounges are evolving as the need to improve the passenger experience gains importance. We take a closer look at some of the key trends emerging from the latest developments around the world

RUTH SLAVID





01. The Air France business lounge at Paris Charles de Gaulle Airport is inspired by garden designs. Photo courtesy of Air France

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02

03



THE PARIS LOUNGE WAS A GIMMICK –  
ALTHOUGH DOUBTLESS WELCOME



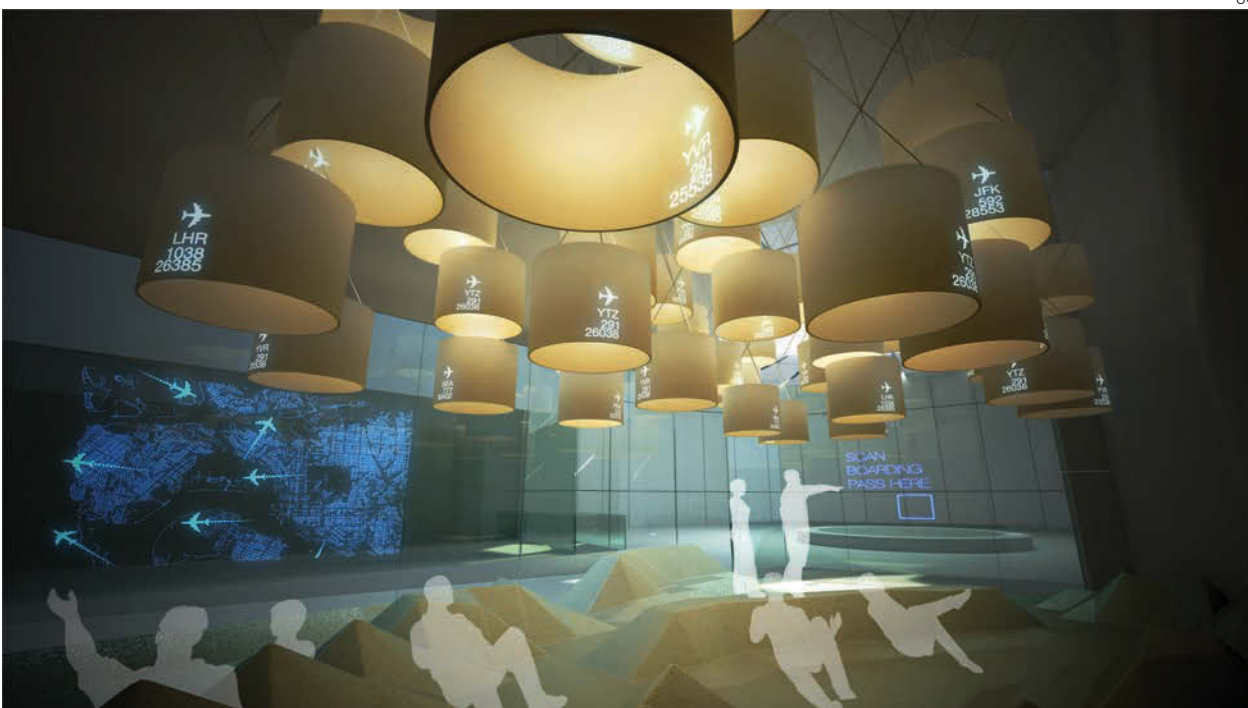
The executive lounge has long been a privilege that only passengers with business or first class tickets have enjoyed, but it is changing beyond all recognition. Where once such lounges traded solely on their exclusivity, with fairly minimal facilities, they are now places where travellers can meet, work, eat, chill and sleep. At the same time, new types of lounges are becoming available to a growing number of passengers.

**LOUNGES FOR ALL** For three weeks during summer 2012, travellers through Paris Charles de Gaulle Airport were able to do something that most budget travellers can only dream of – relax in an executive lounge. Swedish furniture company IKEA created a promotional lounge, which was open to all passengers, with one of the pleasures on offer being to relax on an IKEA mattress. Although the space did not offer the full facilities of a top-class lounge, it did share at least some of the characteristics.

There was a hostess to greet visitors (and presumably regulate numbers rather than, as is normal, keep out those without the correct ticket type). And there was a range of spaces for various activities. The 220m<sup>2</sup> lounge included comfortable seating, televisions and nine bedrooms where passengers could sleep before their flights. There was also a children's play area with several qualified assistants.

The Paris lounge was a gimmick – although doubtless a welcome one. Similarly, the three specially designed Suvanto lounges at Helsinki Airport, also open to all, were created as part of the city's role as World Design Capital

04



- 02. Even if you hate shopping, the IKEA lounge in Paris would be a tempting proposition
- 03. Relax on a sofa and watch TV. If you like the sofa, you could arrange for the same model to be delivered to your home when you return from your trip
- 04. Jason Bruges' vision for a lounge in San Diego centres around lighting



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“

PRIVATE LOUNGES, ONCE THE SOLE PRESERVE OF PREMIUM TICKET HOLDERS, ARE NOW BECOMING AVAILABLE TO MORE TRAVELLERS ”



05

in 2012, but with an aspiration for them to continue afterwards. These lounges showcased furniture by Finnish designers and had specially designed places for recharging electronic devices.

These temporary interventions represent a larger trend. Private lounges, which were once the sole preserve of premium ticket holders, are now becoming available to more travellers. Jason Bruges Studio, mainly known as a lighting designer but also involved in all sorts of installations and interiors, won a competition in October 2012 to design a lounge for San Diego International Airport that will open soon. The New Media Lounge will be open to all and will be a permanent fixture. The space will be all about relaxation, with seating that seemingly rises out of the ground, referencing

## more is more

Once upon a time a cup of tea and a complimentary biscuit were enough to make a lounge passenger feel cherished – but those days are long gone. As airlines compete for business and first class passengers, so there is a desire to offer more at the airport to attract repeat business. Pat Askew, senior associate for aviation and transportation at Gensler says, “It’s the airlines’ investment and attempt to differentiate themselves. They really focus on the passenger experience, which starts at check-in.” Lounges are a key part but only part of a cossetting experience, which starts with dedicated check-in areas.

There is an increasing desire not only for full business facilities, but for facilities that people can use over extended stays – or even when they do not leave the airport at all. James Park, founder of JPA Design says that not only may transfer passengers want to use their time profitably during long waits between flights, but some passengers may not venture landside at all. Instead, flying in from different parts of the world, they may hold meetings in the lounge.

This requirement is leading to the growth of meeting rooms at airports. Askew says, “Meeting rooms and conference spaces are always part of our programme.” Airports such as Incheon in Seoul, Korea, are gaining importance on the international circuit by the quality of conference facilities they offer.

But also, says Park, “If you have been travelling for two or three days, it is incredibly important to be pampered.” As a result, spas are becoming more ambitious, and massage in particular is becoming essential. A generously sized lounge will also be popular because it will offer more space to walk around after the cramped conditions of the aircraft. The one aspect of fitness and leisure not on offer is a gym, because the need to bring workout clothing makes it too much of an effort for passengers.

The other thing passengers may want to do is sleep, if they are staying for several hours. Loungers are fine for a quick doze, but increasingly lounges are installing bedrooms. In China, says Park, with the long distances and many internal transfers, this is becoming important, and his practice is including bedrooms in its offering for Air China.

But however good the lounge, it is still within the sterile surroundings of an airport. A few airports do have external areas, and the new Queen Alia International Airport in Jordan has built gardens next to its lounges. This contact with nature could prove the most impressive regenerator of all.

the nearby rocky scenery – but far more comfortable. Large lamps will hang from the ceiling with flight information relevant to each passenger projected on to the shades. The lounge will be a non-commercial environment where passengers will be able to scan their boarding passes, recharge mobile devices and ‘interact’ with the room, with experiences related to local wildlife and the theme of migration.

**THE PAY-TO-USE LOUNGE** These days passengers who want the full lounge experience still have to pay for it, but they may not need to buy an expensive air ticket in order to do so. Pay-to-use lounges are now nearly ubiquitous. The idea was pioneered by Plaza Premium Lounge Management, which opened its first lounge at

05. The Plaza Premium bar area in Hong Kong International Airport

## food for thought

If lounges are in competition with each other, then one of the ways they can differentiate themselves is through catering and, not surprisingly, their offerings are becoming more ambitious. Virgin's Newark Clubhouse (pictured right), for example, makes a virtue of serving locally sourced food, and at Plaza Premium's lounge at Toronto Pearson there is not only an all-day continental buffet but also a noodle bar.

The sophistication of the offering often involves a certain sleight of hand since, says James Park of JPA Design, the kitchen units are generally compact and the food is usually brought in ready prepared. Lounges are paying rent for the space and want to optimise the number of people who can use it, not fill up the space with back of house.

This means that, while offerings are generous and increasingly sophisticated, they are unlikely to compete with the gourmet restaurants appearing in airports. If a traveller's primary ambition is to eat and drink at the highest level, then such restaurants are likely to attract them. But if they want to relax, maybe work, and eat in congenial surroundings (and without paying for it), then the offerings of the newest lounges should satisfy most tastes.



06. Virgin Atlantic has invested heavily in its lounges, as shown in the airline's latest opening at Newark

Hong Kong International Airport in 1998 and now has its first arrivals lounge there. Currently it runs 90 lounges at 23 airports, mostly in the Far East, Canada and the Middle East. "Last year we served around four million passengers in our lounges, and we are rapidly expanding," says founder and CEO of Plaza Premium Lounge Management, Song Hoi See.

Access to the lounge is by a one-off payment or a membership card, and in some airports these lounges also serve airlines that do not have their own dedicated lounges.

Plaza's latest, at Toronto Pearson International Airport, has been designed by Hong Kong designer Kinney Chan in a colour palette of browns and beiges. This is far more than merely functional, with a specially designed reception chandelier, a mother-of-pearl reception desk and club

armchairs. It offers full wi-fi access, a meeting room and the all-important shower room.

"I believe that the measure of a good lounge is based on a balance of service, food and facilities," says Song. "We continuously implement innovative features into our lounges. For example, all our recently opened lounges demonstrate our fourth-generation concept, which is all about adding a human touch. With technology advancing, I sometimes feel that we are losing personal interaction. This is the same in airport lounges; they become mechanical and almost everything is self-service.

"We have consciously moved away from this and introduced an interactive approach to our lounges where travellers can expect a personalised service from our team. For example, we provide made-to-order Hong Kong-style fish ball noodles at the noodle bar and we have a barista-manned coffee and wine bar."

Airport Lounge Development is a USA-based lounge company. If some of its lounges seem indistinguishable from airline lounges, it is because some of them actually are airline lounges. In some airports the airlines only use their lounges for part of the day, and ALD will lease them for paying users for the rest of the time. In others, several small airlines can share the use of a lounge.

Typical 'dwell times' range, according to ALD, from half an hour to around a couple of hours if a flight is delayed. The fact that people will pay to spend as little as 30 minutes in a lounge – many users head straight there after security, says ALD – is an indication of how important it is to some people to get out of the hurly-burly. This may be because they need to draw breath during a busy travelling schedule, or because they need to get on with some work in comfortable surroundings. Easily accessible wi-fi and a desk on which to put a laptop are hugely preferable to crouching with the machine on your lap and an uncertain connection in a general seating area.

06



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07



08

**THE UPMARKET HOTEL** It is not surprising that many lounges have a great deal in common with smart hotel chains. After all, the clientele are largely the same, and many passengers will either be coming from or going to a hotel. If lounge design is about removing stress from these most cosseted passengers, then giving them surroundings with which they are familiar is a good way of doing so.

James Park, founder of JPA Design, for whom lounges represent a pleasing marriage of his practice's work on hotels and aircraft interiors, says, "The airlines want to extend their brand into the lounge – to exercise their aesthetic. There is often a connection with cabins in terms of the decorative treatment."

JPA is currently designing lounges for Air China, both detailing individual lounges and creating a template that it can roll out to other airports. "Air China is very keen to project an international image," Park says, "while maintaining clear Chinese references."

Similarly, the practice's first and business class lounges for Oman Air at Muscat Airport marry international luxury with a subtle Middle Eastern style. In contrast, the Gulf Air Premium lounge at London Heathrow is far more neutral – a recognition that the airline is not on its home turf.

“ AIRLINES WANT TO EXTEND THEIR BRAND INTO THE LOUNGE – TO EXERCISE THEIR AESTHETIC. THERE IS OFTEN A CONNECTION WITH CABINS ”

The Muscat lounge includes men's and women's prayer rooms, a reflection of a particular cultural requirement. But in general terms, all lounges offer the same facilities. They have spaces to work, and surprisingly still offer desks with computers. Apparently, says Park, there are still many travellers without their own laptops who want to use these facilities. There are spaces to eat and drink. There are showers and increasingly spas, or at the very least the opportunity to have a neck and shoulder massage. Access to electronic information and the ability to plug-in and charge devices are vital. But so is a quiet space where the use of electronic devices is not permitted.

**THE FUNKY LOUNGE** Virgin Atlantic is the airline that has done the most to break the traditional image of the

- 07. Stylish dining at Oman Air's business lounge in Muscat
- 08. The Gulf Air lounge in Heathrow Terminal 4
- 09. Oman Air's Muscat lounges offer a subtle Middle Eastern aesthetic



09



WHILE OTHER COMPANIES STRIVE TO BE INOFFENSIVE, VERGING ON BLAND, VIRGIN HAS A REBELLIOUS ATMOSPHERE



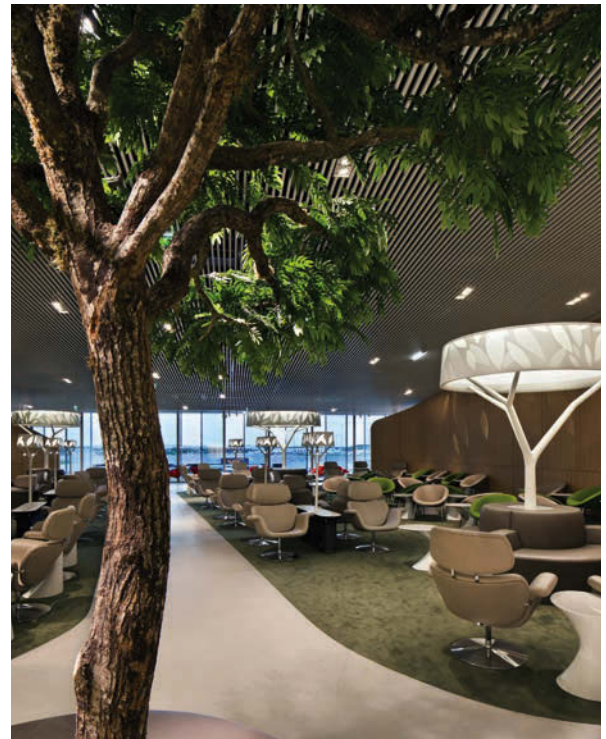
- 10. Air France leads business passengers down the garden path at Charles de Gaulle
- 11. Virgin Atlantic's 'uptown' styled lounge at JFK
- 12. The Virgin entertainment zone at JFK is dominated by a striking flame-red ball sofa

executive lounge. While other companies strive to be inoffensive, verging on bland, Virgin has a slightly rebellious atmosphere as an airline, which is also apparent in its lounges. This is reflected not so much in the facilities it offers – although comprehensive, they are not radical – but in the way they are presented, and in particular in the design.

This starts with the naming. If you are a Virgin Upper Class or Gold Card passenger, you don't go to a lounge but to a 'clubhouse'. The first of these was built at London Gatwick Airport in 1998, but was given a thorough overhaul in 2009 including the addition of a Cowshed spa (Cowshed is a supplier of luxurious bodycare products, so there was glamour by association).

The other London clubhouse is at Heathrow. It opened in 2006 and was designed by young British architectural practice Softroom, and also incorporates a Cowshed spa. More recent are the clubhouses at the other end of the route. The one at JFK opened in spring 2012 and was designed by New York practice Slade Architecture with a deliberately 'uptown' feel. Even more recent, and designed by the same team, is the clubhouse at Newark, which demonstrates its self-indulgent side with a cocktail bar and 'liquid lounge'.

There are other lounges that break the mould. Helsinki Airport's Aspire Lounge, free to loyalty cardholders and available at a fee to others, uses bright colours to give a modern feel, and offers carefully considered resilient flooring to soothe tired feet. In contrast, the airport's



10

almost@home lounge showcases the elegant but relaxed interiors for which the country is famous, moving away from the corporate feel to one that is far more domestic.

Another lounge with a very strong design identity is the Air France business lounge at Charles de Gaulle Airport in Paris. Eschewing any direct design links with the airline or the country, this is a very cool space, apparently modelled on a garden by Brandimage and Noé Duchaufour-Lawrance. While some tree-like forms are evident, the strongest impression is of whiteness and curvaceous forms. Again it follows the orthodoxy of having a number of interlinked but distinctive spaces. But though many lounges are modelled on luxury hotel brands, this is more akin to the boutique hotel. And while not specifically French, it exudes a relaxed chic, a *je ne sais quoi* that is perhaps quintessentially Parisian. ☒

11



12





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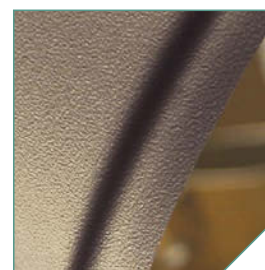
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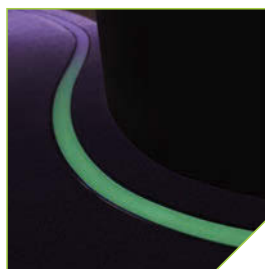
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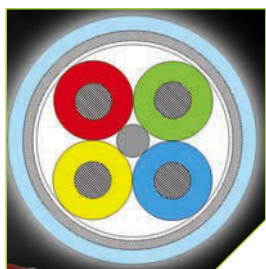
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# Discover Innovations.

*Xlight* – the innovation by BOXMARK - is a leather with a laminated weight of 600 g/m<sup>2</sup>. This special product complies to all international standards and technical requirements for passenger transportation. It is the solution for effective weight reduction. Excellent technical values ensure easy cleaning and a long service life.

*Xtreme* represents a further advantage in the aircraft, VVIP and business jet sector. The XTREME-treatment guarantees perfect protection against dirt and wear.

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Stand: 5B20

# Airbus insider

Variable seating, multiple screens and the Cloud's silver lining... Marisa Garcia talks to Ingo Wuggetzer, VP of cabin innovation and design at Airbus, to get a sneak peek at the future

"Ultimately airlines need flexibility in configuring their seat plans"

Those looking forward to Aircraft Interiors Expo 2014 are no doubt wondering what surprises Airbus has in store to show off on its home turf. A recent conversation with Ingo Wuggetzer, VP of cabin innovation and design, gives us some hints of what to expect when he speaks of the factors Airbus considers most important to improving the cabin experience in the short term.

While standing up for Airbus's proposed 18in standard seat width for long-haul flights, Wuggetzer tells us that ultimately airlines need flexibility in configuring their seat plans. Variable seating configurations are the best solution to satisfy a wide range of passenger needs. Mixed seat configurations with an extra-wide seat on the aisle, for example, would allow airlines to book select high-revenue passengers in the more desirable seats of the economy cabin, while allowing sufficient load factors, optimum cabin utilisation and low-fare seating options from narrower seats on the same seat frame.

When asked the big question of how airlines might bring such a variable configuration to market, with the limitations of many airline reservation systems, Wuggetzer assures us that it is already possible. He cites as an example United's recent introduction of seat-based pricing to its online reservation system, which allows customers to select which seat they want on the aircraft not only by location, but also by individual fare. However, Airbus is not promoting the extra-wide seat at this time.

Wuggetzer also tells us that seat pitch is as great an influencer of comfort as seat width. Airlines, he suggests, can capitalise on this by providing pitch variation, not only by class, but by revenue target, including more pitch in sections of economy to attract those same high-revenue economy passengers.

Cabin space enhancement, Wuggetzer indicates, depends not so much on structure



as space perception. The selection of materials, colours and lighting are as important as pivot bins in opening up overhead space. Airbus strives to provide design elements that ensure not only a bigger cabin cross-section, but, more importantly, imbue the cabin with the feeling of a larger space. He places special emphasis on the importance of innovative lighting solutions in accomplishing this task, also pointing out that lighting can have highly beneficial effects to passenger health and well-being. The A350, he reveals, will generate a very different perception of space through its enhanced cabin lighting. Advancing technologies will also allow important enhancements, providing lighter weight structures, antibacterial surfaces for use in lavatories, and sustainability through the development of compostable interiors materials.

Multidimensional reality and enhanced entertainment, Wuggetzer tells us, are high priorities for passengers. Innovations in IFE,

allowing for the installation of multiple screens for variable functions, such as enjoying a movie on one while keeping up with valuable data on another, will be in high demand. Geotainment (IFE content that allows passengers to connect with the ground by giving information of the regions they fly over) will help passengers overcome anxiety generated by the flight-disconnect and provide value-added service. Airlines will want to capitalise on customer preferences for using their PEDs.

Wuggetzer believes the current trend towards a more personalised travel experience hinges on developments that capitalise on the cloud. Device-enabled check-in, guides provided on a 'mobile companion,' seamless productivity on board and PED-based IFE will become increasingly important. Passengers, Wuggetzer assures us, will want a more intuitive and familiar interface instead of having to learn to use a new device just for their time on board.

# Discover Innovations.

*Xlight* – the innovation by BOXMARK - is a leather with a laminated weight of 600 g/m<sup>2</sup>. This special product complies to all international standards and technical requirements for passenger transportation. It is the solution for effective weight reduction. Excellent technical values ensure easy cleaning and a long service life.

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# SEATING

Stand: 7D40

NEW  
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## Business seat reveal at Recaro

Following the successful launch of the new CL3710 long-range economy seat in 2013 and the generation of numerous large orders, Recaro Aircraft Seating will present its new long-haul business seat at Aircraft Interiors Expo 2014. The full-flat seat will offer excellent living space (even in a high-density configuration), direct aisle access and generous stowage space.

"Our team started their design work with a detailed analysis of today's market and customer requirements," explains Dr Mark Hiller, CEO. "We place high priority on a holistic approach; in the development of the seat we looked at the entire cabin and designed a perfectly coordinated seating environment."

In addition, Recaro will present an evolution of its successful BL3520 economy seat at the show. The seat offers new innovative features such as a tablet holder that enables the ideal positioning of all standard-sized tablet devices with an optimal viewing angle.



Stand: 5B20

## Sitting comfortably?

As the air transport industry evolves, so too does the importance attached to inflight comfort. Airbus will be showing visitors how it is seeking to future-proof its long-haul, wide-body product line – comprising the A330, A380 and A350 XWB – by building in the ability to accommodate passengers who, on average, are taller and wider than their predecessors. Airbus offers at least 18in-wide seats in economy, with the A380 offering 18.5 inches.

Seat width is one of the most important – yet often overlooked – factors for passenger comfort, says the airframer. With at least an extra inch,

compared with common 17in-wide models, Airbus aims to offer travellers more personal space and room for lateral movement. Scientific research that Airbus conducted with the London Sleep Centre shows that just one extra inch of seat width contributes to a 53% improvement in sleep quality.

The additional space throughout Airbus's wide-body fleet meets passengers' demanding requirements for more comfortable long-haul flights. Recent research of long-haul economy passengers shows that 41% of people are prepared to pay more for more comfort within economy class.

Stand: 5A21

## Light stimulation

Supracor will be displaying its Stimulite honeycomb cushions for all classes and crew rests of commercial and private aircraft.

"This past year has been extremely pivotal for Supracor's aerospace programme," says Jeremy Jasiolek, global business development manager at the company. "The airlines, cabin integrators, as well as the OEMs, are recognising the value of the technology and taking full advantage of the comfort, space and weight savings this innovation brings to the industry."

The cushions feature Elastollan thermoplastic urethane (TPU), developed specifically for the aerospace industry in close cooperation with Supracor's partner, BASF. This aerospace grade of TPU has been engineered to meet the industry's strict fire, smoke and toxicity (FST) standards, while providing maximum flexibility and comfort. When used in honeycomb form, the new TPU material also meets the dynamic requirements in thicknesses as low as 1in.

Stimulite honeycomb is customisable to any level of comfort, while saving weight and space, as well as increasing a cushion's useful life when compared

with traditional solutions. Additionally, the ventilation, anti-microbial nature and recyclability of this advanced technology combine to give the end-user a high-value product.

Supracor has successfully integrated the technology into VIP business jet seats, various military aircraft ranging from the F18 Hornet to the H60 Blackhawk, as well as the Boeing 787 Dreamliner and 747-8. The company has recently seen a spike in new development programmes aiming to take advantage of the technology, from airlines and OEMs to seating integrators, for all classes of service, from first through economy.



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## SEATING NEWS...

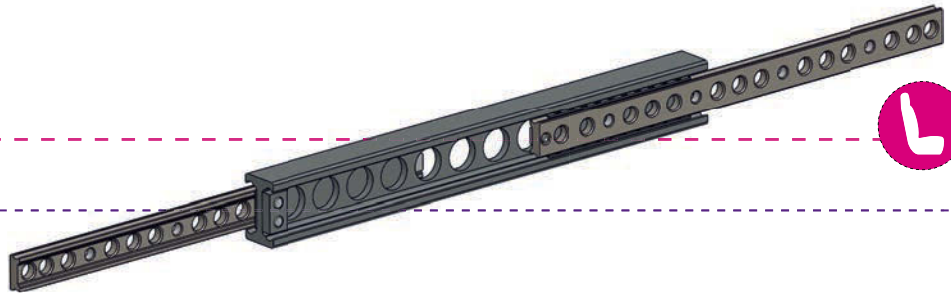
Stand: 1A48

### Lightweight rail launch

Rollon will be offering a new, lighter version of its LTH 30 manually operated, fully extendable, compact, telescopic rail. This cost-effective rail features a high load capacity and reduced deflection, and is used to slide the armrests of business seats.

The rail, always fitted in pairs, is able to absorb relevant misalignment with the mounting surface to ensure a high-quality sliding operation over time. The LTH series of products features two rails – a fixed and a mobile rail – and a T-shaped, compact central element made

of Cf53 steel. The two rails and the central element of this lighter model are perforated, creating a 24% weight reduction compared with the standard LTH version. This lighter version is also available with corrosion-proof surface treatments, such as zinc coating and RollonAloy.



Giotto is designed to combine a sense of openness with a sense of privacy

Stand: 5D51

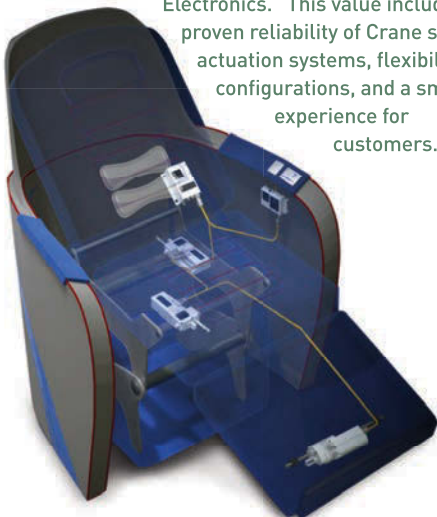
### Motion control technology

Crane Aerospace & Electronics is expanding the worldwide customer base for its mcX Motion Control System, and is also boosting its portfolio of products. Designed and manufactured by Crane for installation on premium aircraft seats, the mcX CANbus system now includes multiple linear and rotary smart actuator technologies, active inflate/deflate lumbar systems, multiple auxiliary modules, and flexible, easy-to-configure software for rapid and seamless system interface development. Crane is under contract to provide the mcX system for all large commercial aircraft platforms flying today, including airline operators in all major regions of the world.

The mcX Motion Control System was introduced at Aircraft Interiors Expo 2011, with a patented modular system architecture that reduces overall hardware and wiring complexity; provides improved maintainability, reliability and system diagnostics; and is highly scalable and configurable.

"Customers have recognised the value of our next-generation motion control system, and the multiple programme wins and large airline customer base validate this," says Chris Cook, VP of cabin system solutions for Crane Aerospace & Electronics.

"This value includes the proven reliability of Crane seat actuation systems, flexibility in configurations, and a smooth experience for customers."



Stand: 5A40

### Simple pleasure

Aviointeriors will present Giotto, a new business seat designed to deal with several different challenges. The seat meets all the requirements of a business seat, while allowing an optimised cabin layout. Designed in a staggered configuration, Giotto maximises the passenger's sitting and living space. Moreover, when in bed mode, the seat goes fully flat, and dedicated ergonomic studies have enabled the bed to be designed in a way that ensures all people – including the very tall – have the same comfort.

Giotto provides easy aisle access to all passengers and the space used

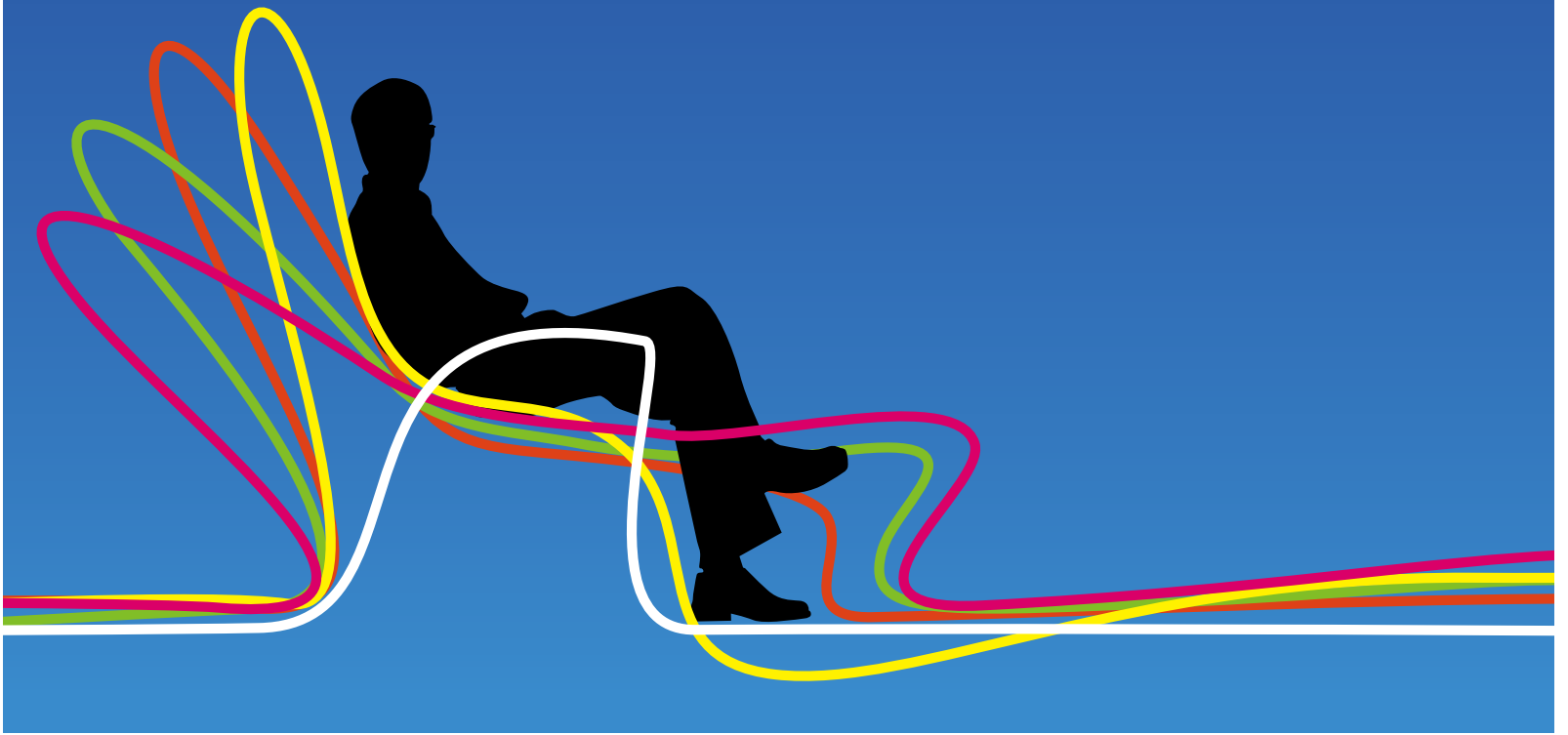
to reach the aisle has been improved by means of some clever methods, such as moving potential encumbrances, such as the literature pocket, out from the passageway. Care has been given to the details, such as a carefully considered space between the seats for the maximum feeling of privacy, and a maximised tray table area created by adopting a new support mechanism. The aim was to enhance the feeling of openness and to achieve the personal and unique experience increasingly demanded by business passengers. Giotto can also be highly customised to meet individual airline needs.







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## SEATING NEWS...

Stand: 7B20

## Suite success

Andy Morris, business development manager at Thompson Aero Seating, discusses the latest projects and contracts at this rapidly growing aircraft seating company

**What will you be showing at the expo?**

Thompson Aero Seating will be showcasing its new Vantage XL business seat. At last year's show we displayed a preview of this all direct-aisle access seat and have already received several orders. Alongside XL will be the latest version of the highly innovative Cozy Suite. Designed for economy and economy plus cabins, Cozy's unique patented design offers increased seat width and personal space alongside a number of other unique features. Completing the 2014 display will be the new Thompson Vantage Suite. Launching later this year on JetBlue's new A321 transcontinental fleet (see page 110), the 'Vantage Suite', complete with a closing privacy door, is already attracting a lot of interest.

**So who has ordered the Vantage XL?**

The launch customer for XL remains unannounced, but in terms of timelines, by the time of the expo the testing and certification phase of the programme will be almost complete. The entry into service for the first aircraft is expected in November, with several other XL customers following closely behind.

**What is the latest news about the Cozy Suite?**

With the current trend of people getting wider and seats becoming narrower, particularly in the economy cabin, Cozy Suite attracted a great deal of interest at the 2013 show. Due to its staggered design, Cozy offers up to 2in additional seat width when compared with the same configuration of in-line seats, in addition to other great features, such as

individual armrests, increased shoulder space and a dedicated sleeping area. There are on-going discussions with several airline customers and we expect to be able to announce a launch customer within the coming months, maybe even in time for the show!

**The Vantage Suite was heavily customised for JetBlue. Do you offer this service to all customers for all products?**

One of Thompson's key differences is our ability to respond and react quickly to our customers' requests, and therefore maximise the customisation opportunities. We achieve this by keeping close control of both the supply chain and production process, which ultimately enables us to be flexible but also maintain our 100% on-time seat delivery to customers.

**What is your latest company news?**

Once again the last 12 months have been very busy at Thompson, with several new customers now flying the Vantage Suite, including Air Canada and Air Astana. It's also seen our first Airbus line-fit programme with the successful

installation of the first shipset of the Thompson Vantage Suite on JetBlue's new A321 aircraft earlier this year. While on the subject of line-fit, we've recently begun our first Airbus A330 line-fit and Boeing B777 programme, and are in discussions with potential new customers about other line-fit platforms.

**Are you creating products for new aircraft types such as the A350 or C319?**

As I mentioned, we currently have significant interest from potential customers across several of the latest platforms including A350, B787 and Bombardier C-Series. We will therefore be looking to further develop and optimise the Thompson product range across these aircraft, as well as exploring potential new product development.

**What's next for Thompson?**

New products and new customers, while not losing sight of our core values of high quality innovative seating, on-time delivery and market-leading customer service and support.

Read more about the JetBlue project on page 110





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Stand: 6C96

# Big ideas

Ahmet Çağrı Özer, general manager of TCI (Turkish Cabin Interior), reveals ambitious plans to grab one-fifth of the cabin interior equipment market

“TCI’s designs are compatible with different types of inserts from any manufacturer”



**TCI is looking to take 20% of the cabin interior equipment market. How can this be achieved, and in what timeframe?**

Since its establishment on 28 December 2010, TCI had short and long-term targets. In the short term, TCI's target was to produce galleys for Turkish Airlines and domestic Turkish operators, and in the long term for EMENA, CIS countries and Russia. TCI has already produced galleys for Turkish Airlines' Boeing 738-800 fleet and also completed a VIP programme for Gore Design Company. According to TCI's business plan, TCI will now focus on wide-bodies to penetrate in to EMENA, CIS and Global Markets in the next five years. TCI is very proud to combine its dynamism and vision with its valuable stakeholders Boeing, Turkish Airlines and Turkish Aerospace Industries. I believe this fruitful collaboration may provide a high

level of excellence and TCI will be one of the leading cabin interior companies, bringing premium quality, more capacity and high technology.

**What makes TCI galleys different?**

TCI was established as a joint venture between Turkish Airlines and Turkish Aircraft Industries. Turkish Airlines is well known in the global market as an operator, and provides feedback to TCI for continuous improvement. Turkish Aircraft Industries is well known in the aviation industry for its production and design capabilities. Using the support from its shareholders, TCI designs durable and premium galleys with good quality and reasonable prices.

**Is TCI galley equipment suitable for both ATLAS and KSSU?**

Right now, TCI designs are only compatible with the ATLAS standard

unit but TCI can design and produce KSSU compatible galleys if requested.

**Will you move into galley insert manufacturing?**

TCI has no short-term plans for insert manufacturing in the short term. However, at the moment we are supporting very well-known local companies for insert manufacturing. We believe that this will trigger more domestic manufacturing in Turkey, thus developing better value through the supply chain. Also, TCI's designs are compatible with, and flexible enough to support, different types of inserts from any manufacturer.

**TCI equipment is currently available on B737s and A330s. Will this be extended to other types of aircraft?**

TCI is planning to extend its range to B777s and A320s. We are currently doing some R&D activities for the A320.



Stand: 6D99

## Elesa to be shown

TSI Aviation Seats, the first domestic aircraft seat manufacturer in Turkey, is a JV company of Turkish Airlines and Assan Hanil Automotive. The company designs, produces and markets aircraft passenger seats, and has recently completed the design of a range of single-aisle, short-range economy- and convertible-class aircraft seats named Elesa – the name being derived from 'elegance' and 'safety'.

The slimline and lightweight Elesa seats have gained ADOA,

POA and ETSO certificates from EASA. Following the acquisition of the necessary certificates, TSI started serial production in late 2013, and the first order was placed for the retrofit of 25 Boeing 737NG aircraft by Turkish Airlines in 2014.

TSI aims to offer its seats at a lower price than other seat manufacturers, with short production times. The company has a production capacity of 10,000 seats per year, which will be increased to around 100,000 seats per year in the near future.





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## SEATING NEWS...

Contact Sogerma early to arrange a trial of the technology

Stand: 5B11

## Tailored approach

Sogerma, in addition to showing its range of seats, will be demonstrating its new and advanced configuration software and 3D virtual reality presentation tools. Using these tools, users can configure any selected seating product to their desired trim and finish.

In addition, in a dedicated 3D projection room, visitors can walk around, sit in and explore the cabin in a virtual reality. This service allows customers to view the range of Sogerma products – from a passenger's eye view – according to their individual specification: various seat kinematics (seating positions or technical options such as lamps, arms or motions, for example) in different cabin configurations. This unique experience is part of Sogerma's range of customer experience tools for sales and marketing.

Stand: 5A50

## Trading platform

With the increasing demand for used aircraft interiors, buyers need to simplify their sourcing processes. This is exactly what aviationgate.com has been designed for. Using a high-speed search engine with sophisticated database technology, aviationgate.com makes it easy to search globally for the exact products needed, or to offer interior stock for sale in a simple step-by-step process.

To search for products and services, just choose the desired product category and add aircraft type, model, condition or any other properties.



You then receive a full list of available products that you can filter, sort, watch, compare and request online, right away. Clients can receive a proposal within one working day – and this is without any monthly fees.

A personal dashboard displays the latest activities. Users can also post special requests to a noticeboard. To ensure high-quality product listings, experts from aviationgate.com verify every product.

Register online at aviationgate.com or meet the aviationgate team in person at the show.

Stand: 6E64

## Green clean

Celeste Industries' new water-based MicroGreen adhesive and gum remover is claimed to be not only highly effective, but also 100% biodegradable and environmentally safe. The product was designed to ensure efficacy, while eliminating the issues often associated with products that

contain high VOCs or petroleum-based solvents. Replacing the chlorinated/aromatic solvent base chemistry typically used for such products with an oil-in-water emulsion results in a product that remains highly effective, without damaging plastics or softening paint.



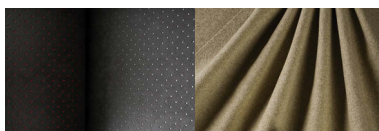
## In other seating news...

Stand: 7B08

A new dress cover system has been developed by Franklin Products, which is slated for introduction at the expo. The system, named Velocity, is designed to speed-up the installation and removal of aircraft seat covers, while making it easy to achieve the crisp fit and finish desired on slimline seats. Instead of the commonly used hook-and-loop design, Velocity uses an advanced attachment to secure a simplified cover that can be stripped from the seat in seconds. The cover can be installed rapidly without tools, and results in a neat high-level fit and finish. This rapid installation and removal means shorter assembly times for seat builders, and savings for airlines eyeing lower maintenance costs.

Stand: 1E30

Miko is introducing visitors to Dinamica Aviation, claimed to be the first ecological microfibre for aircraft seats. Its production process is similar to that used for paper recycling in which no harmful chemical substances are used. The recycled polyester is derived from polyester fibres (T-shirts, fabrics, fibres) and PET (bottles, plastic, etc). Using recycled polyester offers lower energy consumption and CO<sub>2</sub> emissions than petrol-based production processes.



Stand: 6D60

Dräxlmaier Group, a supplier to premium car companies – including Audi, BMW, Bugatti and Rolls-Royce – is expanding its aviation activities, bringing its automotive interior competence to VIP aircraft. The portfolio of the Dräxlmaier Aviation GmbH (DAG) division ranges from seats to interior furnishings and headliners. DAG's first offerings will be launched at the show. "Qualities that are essential in the automotive world, such as lightweight construction, are also a necessity in aviation," says Klaus Schlarb, head of DAG. "We believe we can create aircraft interiors that are influenced by the best the automotive world has to offer. This will give aircraft interiors a new edge."



# Driving seats

Stand: 7D40

Dr Mark Hillier, CEO (and soon to be partner) of Recaro Aircraft Seating, offers some insights into this ever-expanding company and its latest products and capabilities

"Thanks to optimised material flows, the plant can produce parts faster and implement short-term change requests for clients more easily"

## What will you be showing at the expo?

After the successful launch of the new CL3710 long-range economy seat in 2013, Recaro Aircraft Seating will present its new long-range business seat at Aircraft Interiors Expo 2014. The Recaro team started the design work with a detailed analysis of today's market and customer requirements. In the development of the seat, the team looked at the entire cabin and designed a perfectly coordinated seating environment. The new full-flat seat offers excellent living space, even in a high-density configuration, direct aisle access and generous stowage space. It invites passengers to sit back, relax and enjoy their journey in an aesthetically appealing atmosphere.

In addition, Recaro will present an evolution of its successful BL3520 economy seat with a new design and some innovative features, such as a tablet PC holder.

## You showed a new business class concept at last year's expo: how is that project progressing?

We presented that concept with a conscious aim of starting a dialogue with our customers. We wanted our concept seat to trigger reactions at the trade show and spark discussions with our customers on business-class options. We received positive reactions and gained further insights for our future business-class products.

With our new CL6710 business seat, we have taken a different approach: we integrated all the customer feedback we received into this seat, and we conducted a comprehensive testing programme. Thus, at the expo

we will be presenting a new business seat that is ready for sale.

## What is your latest company news?

Apart from being CEO of Recaro Aircraft Seating, I will in future also be involved as a fellow partner in the company. I will successively acquire shares in the manufacturer on a performance-based model over a period of 25 years, starting in 2014. An agreement was concluded with Martin Putsch, a shareholder of Recaro Group, that stipulates that I will acquire a stake of around 10% of Recaro Aircraft Seating over the long term. Currently, all shares are held by Recaro Holding in Stuttgart, Germany, the brand and financial holding of the Recaro Group.

Also, to provide more flexibility and speed, Recaro has invested €3m (£2.5m) in the systematic expansion of component manufacturing at the plant in Schwaebisch Hall, and a new punch/laser unit installed at the plant for sheet metal structures further increases competitiveness. Thanks to optimised material flows, the plant can produce parts faster and, for example, implement short-term change requests for clients more easily. This has a positive effect on lead times – and thus also on the delivery performance of Recaro. With this new laser centre, productivity is improving by up to 20%. Moreover, through the redesign of sheet metal production from individual machines to holistic process chains, Recaro has been able to reduce the lead time by up to 50%.

## Are you creating products for new aircraft types, such as the A350 or COMAC C319?

Yes, Recaro is supplying products for new aircraft types such as the A350.

But unfortunately we cannot disclose any further details at the moment.

## What's next for Recaro?

In response to market developments and the growing demand for Recaro products, the company expanded capacities at its plants around the world in 2012 and 2013. In late 2013, Recaro opened a manufacturing plant in Qingdao, China, in order to produce seats for the local market. The first seats for the plant's first customer, Shandong Airlines, will be delivered in early 2014. The airline has ordered the BL3520-RAC seat for its B737 fleet. The seat, intended for use on short- and medium-haul flights, is a special edition of the BL3520 seat for economy class, which has been adapted to meet the needs of the Chinese market.

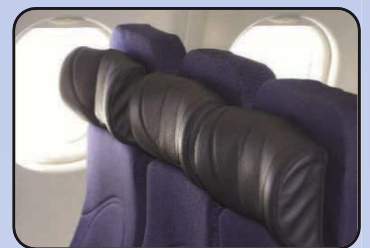
Furthermore, Recaro Aircraft Seating is strengthening its presence in the Middle East. The company opened its Regional Customer Center Middle East in Dubai in February 2014. This will enable Recaro to offer airlines in the Middle East and Africa comprehensive services just a short distance away. At the new centre in Dubai, a team of representatives from the Recaro sales organisation takes care of the needs of customers in the Middle East and Africa, while Recaro technicians offer training and support in mechanical operations to customers on-site. The centre also helps ensure that customers can be supplied with replacement parts within a very short period of time. The distribution of parts is handled by the aircraft parts and supply chain specialist Avio-Diepen on behalf of Recaro.





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## MONUMENT NEWS...

Stand: 5D10

## A grand welcome

AIM Aviation will be unveiling a striking new concept interior at the expo, designed to showcase today's feasible limits in terms of design, materials and realisation. The company hopes to inspire visitors with 'the art of the possible' and construct a visionary interior born of congruous design and engineering.

Richard Bower, group commercial director at AIM Aviation, explains, "We want to introduce both new ideas and genuine options. While this is an exercise in the possibilities of design and manufacture, we are creating an

interior that is entirely achievable. The concept interior will present the idea of blending styles between bars and galleys. It is based on the Door 2 galley and bar complex of a Boeing wide-body aircraft, but will also work for Airbus long-range platforms. Door 2 is essentially the lobby of the aircraft and creates the all-important first impression for passengers. We want to create continuity, connection and a greater sense of space with a galley

structure that is closely aligned to the adjacent bar unit in terms of style."

The integrated bar and galley complex will provide the functionality required of a galley, but will be stylised to meet the design ambitions of airlines. Innovative display and storage solutions will also be presented, along with creative lighting schemes and materials.



Stand: 6B88

DON'T MISS  
THE CRYSTAL  
CABIN AWARD  
RESULTS ON  
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## Galley guile

Altitude Aerospace Interiors' new galley designs are soon to be in service on a fleet of Boeing 767Fs. Altitude was briefed to come up with a solution that would maximise the usable galley space, including a coffee maker and chiller unit, which are not typically offered on freighter aircraft. Altitude successfully accommodated the variety of inserts and improved the construction and assembly techniques of the galley, while maintaining an aesthetic and styling that will differentiate this galley for the market.

Altitude identified many areas in which it could add functionality and better utilise space within a galley area. A desire to create a world-class galley system capable of serving the widest range of customers motivated the design team to challenge traditional galley models and explore fresh ideas. With key drivers of weight in galley design and construction, Altitude investigated alternative materials and construction methods to develop a galley with improved dimensional tolerance and quality.



MEET  
THE TEAM...

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MONUMENT NEWS...



Flightweight estimates that thefts from carts costs the airline industry GB£30m a year

Stand: 5B60

A WIDE RANGE

Bucher is launching several product lines at the show, focusing on innovation, quality, reliability and light weight. These designs include a new line of tablet deployment and docking solutions, and a new IFE deployment unit with improved reliability, simplicity and feel. Further enhancements to Bucher's line of front row monuments will also be displayed, alongside a range of lightweight galleys, a stretcher and a premium-class food tray table.



Stand: 7A30

Jamco celebrates Emirates deal

In November 2013, Jamco group received orders from Emirates Airlines for 50 shipsets of galleys, closets and other cabin equipment for its fleet of Boeing 777-300ER aircraft. Emirates uses these aircraft on its major overseas routes.

In fulfilling previous orders, Jamco group has delivered 48 galley shipsets since February 2011, and the company sees this order for an additional 50 shipsets as clear evidence that the airline highly values its technology, as well as its quality and delivery punctuality.



Stand: 1D20



Worth the weight

At the expo, Flightweight is launching SmartCart, a new lightweight cart claimed to be up to 6kg lighter than conventional carts. The cart is designed to be easy to assemble and it can be flat-packed to minimise delivery costs. It is also insulated and temperature monitored, so it's suitable for both food and duty-free.

A range of security features also help to eliminate theft and tampering, which Flightweight estimates to cost the airline industry at least GB£30m every

year. Operated by electronic proximity cards, the system records the date, time and identity of up to 20,000 individual users, helping operators to track exactly when the cart has been used and by whom. This lock-and-seal technology deters opportunists and repels sophisticated attacks, creating a tamper-proof audit trail and legally admissible tamper-evident records. No capital expenditure is required for the carts, and competitive lease options are available.

Stand: 6A78

A resting development

TTF Aerospace is offering a new lower-lobe crew rest configuration project for A330s. With room for six bunks and additional seating for crew, this configuration is designed to provide ergonomic and space-use advantages, as well as weight savings over comparably sized crew rests. The crew rest can help airlines to comply with the new FAA Advisory Circular 117 crew rest rules, while providing more payload flexibility than previously envisioned.



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Stands: 6B20, 7B40

# star quality

Zodiac Aerospace is always one of the biggest draws at the expo. Representatives from three of its divisions share a little of what to expect in April

## Laurent Stritter

Vice president of marketing and product strategy, Zodiac Seats

### What innovations will Zodiac Seats be showing in seating at the expo?

"The 2014 show will be a highly strategic event for Zodiac Seats as we will be introducing a newly revamped product range, from short-haul economy to a highly sophisticated first class. Some concepts will be shown to selected visitors in two experience rooms in order to get their feedback (one will be dedicated to the Y/C segments and one to the B/C segments).

Our team has worked together to combine best practices, know-how, cultures and experiences to develop innovative and differentiating products. We will present our vision of the market, share future seat trends we have imagined, and new technologies we have integrated to support these concepts.

### Which area of Zodiac's seating range is growing the most?

In front of each segment and subsegment identified on the market, we offer the widest and most efficient product line. Our product range starts with simple and super lightweight short-haul economy seats, all the way up to sophisticated high-end first class suites with unique features and styles for each airline. Each segment is important, and at the front of each, you will find a Zodiac Seats product to meet customer needs.

### A little time has passed now since the acquisition of IMS. Is the ability to deliver a complete Zodiac seating product proving popular?

Recent commercial successes have proved that the 'package offer' positioning developed by Zodiac Aerospace is a real asset for airlines. Well suited for the retrofit market, our package solution maximises value – improving experience and significantly reducing cost, weight and lead times.



## Thomas Lee

Director of marketing and innovation, Zodiac Galleys and Equipment

### What innovations will Zodiac be showing in galleys?

Our focus has been revenue enhancement for airlines. In coordination with other Zodiac Aerospace divisions, we have innovated the T- and U-shaped galleys. When these are combined with Zodiac Aerospace seating products, more revenue-producing seats may be added to typical LOPAs. Within these new galleys, there are galley-insert innovations as well. For example, we will be presenting our double-deep ovens in Hamburg. These newly configured ovens fit into the new and deeper T-shaped galleys, allowing for double the meal capacity in a single oven space. Zodiac Aerospace will also be showing a front row G2 galley with integrated airbags, which allows seats to be set closer to these monuments, further enhancing seat density solutions.

### What other innovations will Zodiac be showing? What is the 'big reveal'?

Our big reveal will include a full section of a wide-body, premium cabin, showing how various Zodiac Seating products, combined with lavatories and galleys, can optimise the cabin with significantly more revenue-producing seats.

"Our big reveal will include a full section of a wide-body premium cabin"

## Scott Savian

Executive vice president of ZEO

### What's the latest news about the ISIS interior?

The overall ISIS (Innovative Space Interior System) approach to optimising the cabin for both revenue generation and an improved passenger experience seems to be truly appreciated by our customers, with a considerable number of lavatories and several new interior customers in place. We have broadened this approach to include more products, such as galleys, and are excited about our ISIS Premium Cabin mock-up, which will be shown in Hamburg.

### Have there been any new developments at ZEO?

ZEO continues to take an active role in driving many new products and helping our business units meet their objectives. This includes active participation in the Crystal Cabin entries this year. As always, the best answer is wait and see!

### What innovations will Zodiac be showing in lavs?

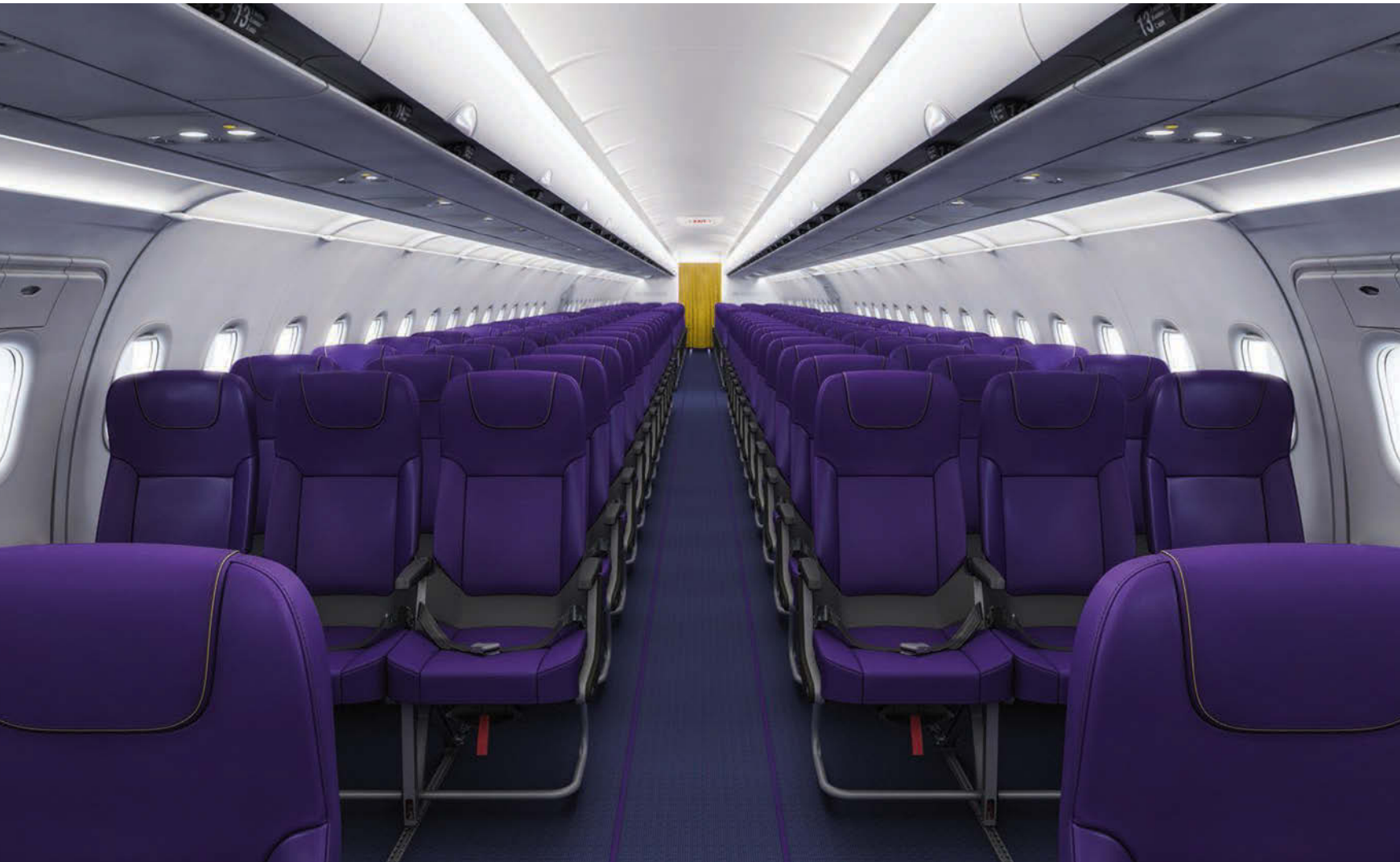
Zodiac Cabin & Structures, with ZEO, will be showing an advanced lavatory system featuring new levels of customisation, space optimisation, revenue generation and passenger experience. The Dynamic Modular System – our third-generation modular lav – really makes leaps forward in value throughout the product lifecycle.





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# CABIN MATERIALS



Stand: 5C66

## Laser-etched fabrics

Visit the Tapis stand to see its latest offering: laser etching on Ultrasuede fabric. A custom laser-etching process adds a pattern to the fabric without needing a screen or roller for printing. This laser system has been designed to customise Ultrasuede to fulfil individual design visions without compromising the quality and durability of the product. The

system can work from roll to roll in continuous mode, and the process can duplicate a pattern from a photograph, thus offering exclusive decorating effects. There is no environmental impact, as no water or chemical products are necessary for running the system, and no waste is produced that requires disposal with special processing.

Stand: 7E11

## Big announcement

STAG Group will officially announce at the expo its new division, which specialises in products and support services for aircraft interiors. The established aircraft component supply and management company has introduced the new arm to its operation to focus on the specific requirements of cabin interiors. The company currently supplies its own Flitetec branded solutions and represents products from other aerospace manufacturers. As part of its wider offer, the company has supported the interiors market for over 25 years. The move to form a dedicated division comes as a result of STAG Group's growth, and benefits the industry by providing a portfolio of solutions to meet the specific needs of this sector of airline operations. Established customers include Zodiac Aerospace, AIM and Diehl.

Visit stand 7E11 for full details on STAG's new interiors division

Stand: 7C05

## One vision

Through the newly established Triumph Integrated Aircraft Interiors Division, Triumph Group customers now have a single point of contact for addressing existing and future interiors components and systems needs. The division, led by MaryLou Thomas, employs more than 2,000 experienced engineers and technicians worldwide, and has manufacturing and support facilities in North America, Europe and Asia.

Via its dedicated in-house R&D, engineering, manufacturing and programme management teams, Triumph can provide thermal-acoustic insulation systems, environmental control system (ECS) ducting, floor panels, interior products and reinforced thermoplastic laminate components for current platforms as well as new platforms. With full interiors lifetime capabilities, aftermarket support is available for all business and commercial aircraft flying today.

Jeffrey D Frisby, president and CEO of Triumph Group, explains, "With our lean focus and agile organisational structure, we can function as a part of a customer's team either virtually or physically on-site, performing discrete tasks or accepting full responsibility for a component or system throughout its lifetime."



## CABIN MATERIALS...



Stand: 1D41

## Plastics repairs



Following a successful soft launch in September 2013, Satto, a plastic engineering solution created by Specialist Aviation, will be shown officially for the first time. The product is

designed to offer an alternative to scrapping and replacement of damaged aircraft interior plastics, enabling repairs such as hairline cracks or sheared parts to be bonded, prepared and painted in workshops – or even on the wing – without the need for any special tooling.

The mixed solution, which is fully supported by an Engineering Order, fulfils toxicity requirements and takes less than 30 minutes to cure at room temperature. Once cured, it can withstand twisting and bending far beyond normal usage. It can also be colour-matched to the Pantone colour shades of operators' own branding.

Stand: 5C60

## Future thermoplastics

Visitors to the Kydex stand can see and touch the company's collection of design-forward thermoplastic sheets, view in-development materials and finish trials from the Kydex designLab, and share plans and challenges with the sales and design team.

The highlight at this year's event is a special preview of the next-generation Kydex 6503 sheet. This product, which is still in development, further improves the pearlescent system engineered by the company for reflecting and refracting light by enhancing geometric plane and direction. The colours shift when the object or viewer moves, and the effect has an amazing range: designers can choose how much the effect highlights a feature in a finished part – from a fine pencil line to a bold, bright outline, to a subtle glow.

By invitation only, Kydex will share its future vision of patterns in product, textures, tactile experience and the next generation of colour and fabrication techniques that can transform and elevate a brand and passenger experience.

The Kydex designLab enables the company to collaborate with customers on challenging projects

## Aviation only

Stand: 5B61

Perrone Aerospace's Marc Cognetti explains why the company will have a strong presence among the leather manufacturers

**What will you be showing at the expo?**

Perrone Aerospace will display a broad assortment of performance leathers and textiles along with our complete complement of leather care and cleaning products. We will be highlighting our proven ultra-lightweight leather alternative, EnduraLite Leather, in addition to our new exciting innovation of 65/65 heat release fully compliant material, MonuLite.

**Any new deals or customers?**

We are continuing to expand into markets such as Russia, India and Africa along with new customers in Europe and Asia. Our EnduraLite lightweight leather alternative has made tremendous strides over the past year and has been selected by the new generation of lightweight seat suppliers in Europe as well as being specified by Air Wisconsin, Monarch Airlines,

Air Lingus and Air France, with additional worldwide orders in the pipeline.

**Are any clients opting for daring colours or finishes?**

One of the strengths of Perrone continues to be our ability to custom colour match to any application. We welcome designers who push the envelope of traditional design, and enjoy the opportunity to work with our master finishers creating unique colour combinations, finishes, gaufrage prints and embossings.

**What makes Perrone products stand out from the competition?**

Our focus and commitment to aviation. Perrone offers the most complete selection of performance leathers and textiles for any aircraft application, and we continue to innovate and develop

new products to meet the demands of our customers.

The relationships we have developed with the finest tanneries all over the world give us access to the highest quality raw material available.

Our skilled craftsmen, who between them have over four generations of leather finishing experience, are able to produce the very finest quality finished product available for the corporate, VIP and commercial aviation markets.

There are leather suppliers in the marketplace that offer cheaper prices than we do. However, as a dedicated leather supplier to the aerospace industry, we are able to offer a complete 'cradle to cradle' solution, from raw material through finishing, cut to pattern options, care and cleaning chemicals, and FAA-certified repair and refurbishment through fully recycled and repurposed products.

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## CABIN MATERIALS...

# Leather lines

Stand: 6B50

Archie Browning, sales director at Muirhead, is proud to see his company's leather products being used across the entire passenger experience

### What will you be showing at the expo?

Muirhead will showcase its full range of high-performance, low-carbon leather for aviation. The theme of our stand will be an airport executive lounge, which is a new sector of aviation business we have picked up in recent years. Now we can truly claim that our leather can feature in every step of a passenger journey from their front door to the aircraft – from the chauffeured cars to the airport lounges, to the airside buses, to the aircraft. Muirhead offers a product suitable for all aviation interior needs, on the ground or in the air.

### What are the newest additions to your range?

The latest addition is a lighter weight product that is a full substance 1mm leather that is 30% lighter at 600gsm. This is already proving popular in the market, and has recently been selected for an all-leather economy

cabin. Less weight doesn't mean less leather, but it does mean lower fuel consumption for airlines, which is important from both a cost and environmental perspective. Muirhead remains the world's only 100% leather that is genuinely low carbon.

### What is your latest company news?

The company has recently completed comprehensive investment works to expand the laboratory facilities at its headquarters in Glasgow, Scotland, with Dr Raymond Gosland appointed as technical director to lead the company's product development and innovation.

### Any new deals or customers?

We aim to continue supporting our global customer needs for new and refurbishment programmes, be that in our domestic market or to any one of our 130, including reduced overall costs, reduced carbon emissions, reduced

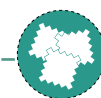
waste and greater visibility. We have airline customers in 60 markets around the world, and we are delivering an increasing amount of leather in cut parts, thanks to the investment in our new state-of-the-art cutting plant.

### Are any clients opting for daring colours or finishes?

Yes, absolutely. Muirhead is famous for its colour-matching service.

### What makes Muirhead products stand out from the competition?

Quality, high performance, genuine low-carbon leather. British Airways recently re-ordered Muirhead leather to refurb its European fleet – more than 13 years after we fitted the leather to the fleet when new. Due to the quality of our hides, our customers gain more yield. A customer recently had 10 hides left over from a small job because the average hide was 5m<sup>2</sup> and offered a good yield.



Stand: 1D39

## The best in crests

ABC International's latest project is the design, manufacture, certification and installation approval of decorative crests for airline cabins. For example, starting with a company brand logo, ABC is able to develop a 3D design style proposal, industrialise it for manufacturing, and deliver the decorative crest approved and ready for installation. ABC designed and manufactured new decorative crests for the new Air Canada B787 fleet in three variants. Working with Boeing, the designers at Teague, Boeing's monument suppliers such as AIM and B/E Aerospace, and under the coordination and guidance of Air Canada's cabin design team, the outcome is a high-quality cut and milled aluminium crest, representing the airline's maple leaf logo and script.



Items such as these crests are important in strengthening cabin branding and differentiation

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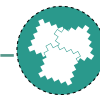
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## CABIN MATERIALS...

Stand: 5D20

### WATER-BASED COATINGS

Paint shop managers will be familiar with the many variables that can affect paint application.

Obtaining consistent gloss levels, colour appearance and uniform textures across components is a problem shared by those running facilities around the world, and issues surrounding repeatability become even more taxing when components are painted in different facilities prior to assembly.

Mapaero, a specialist in water-based coatings, has recognised this situation for some time, and its research with painters and industrial designers has led to the release of a new generation of topcoats designed to reduce these risks.

The secret of this new material, released under the brand name FRC, is the presence of small particles inside the paint layer, which create a direct texture. With confidence in the textured appearance being uniform, painters no longer need to be concerned about parts matching those produced elsewhere.

FRC requires only one coat compared with two of standard paint to obtain textures offering excellent weight reductions and time savings, and it is applied with normal equipment. FRC is water based, available in any colour, and meets the expected flammability requirements. FRC is approved for use by Airbus and samples are available on request.

*Small particles inside the paint layer create the texture and ensure uniformity*

Stand: 1B49

## FAA approves magnesium alloy

Since 2007, the use of magnesium alloy in commercial aircraft interiors has been the subject of an FAA task group investigation that asked, can magnesium be safely used in a cabin application? The weight-saving benefits are obvious, but authorities such as the FAA need to be convinced that levels of safety are not reduced – which is why certain alloys have been the subject of exhaustive development and testing for the past six years.

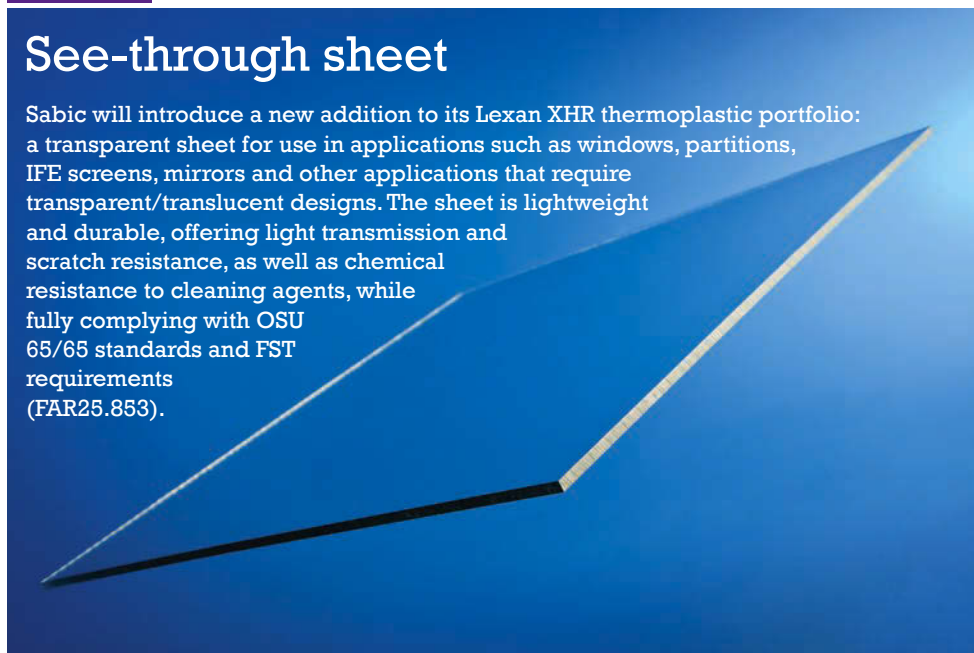
Magnesium Elektron says that flammability tests on its Elektron 43 magnesium alloy showed that the material produced no measurable adverse or hazardous

environment compared with standard economy seats containing aluminium. With FAA testing complete and the development of a lab-scale test procedure finalised, the FAA will now allow magnesium in aircraft seats, providing requirements and conditions set out in the special conditions are satisfied. This is good news for airframers, airline operators, and interiors manufacturers – particularly those involved in seating, where the best potential for weight savings can be found. Visit Magnesium Elektron's stand to learn more about the company's newly developed non-flammable alloys and for the latest news on current regulations.

Stand: 7B70

## See-through sheet

Sabic will introduce a new addition to its Lexan XHR thermoplastic portfolio: a transparent sheet for use in applications such as windows, partitions, IFE screens, mirrors and other applications that require transparent/translucent designs. The sheet is lightweight and durable, offering light transmission and scratch resistance, as well as chemical resistance to cleaning agents, while fully complying with OSU 65/65 standards and FST requirements (FAR25.853).



Stand: 1B44

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## Light and bright

Majilite, a first-time exhibitor, has announced its product line for cabins. Products include Majilar, a lightweight and fire-retardant fluoropolymer film; AeroTec leather, a lightweight synthetic leather for soft surfaces that is claimed to be half the weight of leather and comes in hundreds of grains and thousands of colours; and TecDec-M1, a lightweight and inherently fire-retardant decorative laminate that meets or exceeds FAR 25.853 requirements for flammability, heat release rate and smoke and gas emission requirements for aircraft interiors.

## MATERIALS NEWS...

Stand: 1D37

### Good enough to eat?

DuPont's Krytox high-performance lubricants include grades with special additives for aerospace interior applications. Originally designed as an assembly aid for screws and couplings of oxygen systems, 240 AC is now also used in a variety of applications including seat adjuster mechanisms. Krytox GPL 105 oil and GPL 205 grease eliminate squeaking and creaking when materials come into contact with one another. In addition, Krytox GPL 205 H-1 is NSF approved for incidental food contact, making it suitable for galleys.



Stand: 6D50

## CMF trends revealed

Lantal Textiles will be presenting a realm of fresh ideas for aircraft interiors. Every two years, Lantal produces its Trendletter, which constitutes the basis for the Conceptual Forecast collection with four different themes. For professionals, it is a treasure trove of ideas, enabling designers to coordinate seat cover fabrics, carpets, leathers and curtains within a balanced overall design concept. For 2014, the themes are as follows: for its largely feminine 'Blush' theme, the team was inspired by a kaleidoscope. The highlights of this trend vector are refraction, mirror images and superposed colours that produce crystalline forms.

In 'Framework', the focus is on systematically constructed structures and three-dimensionality. The emphasis is on contours. The juxtaposition of similar elements creates

a new ensemble, giving the patterns an architectural yet filigreed aura.

The 'Metroplexity' theme owes its self-confidence and presence to chequerboards and stripes accentuated with reduction and the density of luminous colours.

In contrast with the Metroplexity theme, 'Sanctuary' focuses on monochrome surfaces and divergent materials. Additionally, its matt/gloss polarity creates a demure and mystic look and feel.



Stand: 1B01

## High fashion

Scott Group custom carpets looked to fashion as an influence for its latest aviation collection, which is being premiered at Aircraft Interiors Expo.

"We looked to the catwalks for the new neutrals – men's suiting was a big inspiration, with interesting shades of brown and taupe, as well as deep indigo blues," says Jessica Courtright, Scott Group's senior designer. "We were also inspired by the types of prints being shown on the runway – interesting textural pieces, bold geometric patterns shown by designers like Missoni and Marc Jacobs, and more ornate patterns inspired by

embellishments like embroidery, lace and brocade fabrics shown by Oscar de la Renta and Roberto Cavalli," she adds.

"More surprisingly, ornate brocade fabrics were also popular, taking very traditional type patterns and applying them to modern pieces. We were very interested in that juxtaposition of taking something traditional and interpreting it with a modern sensibility, especially for the VIP business jet market. The result is luxury carpet that is both modern and timeless."

Scott Group custom carpets are represented in Europe by Carter Green Aerospace.

Marc Jacobs, Missoni, Oscar de la Renta and Roberto Cavalli may influence next season's carpets





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# All in good taste

Dr Andrea Schöllgen, senior strategy consultant at Designaffairs GmbH, will be taking the subject of good sense and good taste to another level at the Passenger Experience Conference

## What clients do you have?

Designaffairs supports companies from a wide variety of industries to guarantee the exchange and transfer of knowledge.

Our core branches cover the automotive, railway and aircraft industries, the healthcare and building technology sectors, as well as the software, consumer electronics and household appliances businesses. Designaffairs consults with big organisations and holdings as well as small and medium-sized companies on all issues concerning industrial, interface, usability, colour, and material and packaging design, as well as for research, analysis and engineering.

## You'll be discussing multisensory branding at the conference. How should an airline feel to different senses?

The idea of 'feeling an airline' is about brand congruent perception on multisensory channels. Let's first talk about experiences.

An experience is the interplay of our five senses, rated in our brain whether we like something or not. The number of senses stimulated dictates the intensity. An intensive experience is memorable.

Secondly, a product is a brand's most important communicator; it is the closest contact to the customer. A product communicating the same values as the brand is its ambassador. Using multisensory channels, the brand is even more recognisable and the branded experience more intense. A great experience creates loyal customers – the greatest value in a price-driven market such as the airline business.

That's why we think all touchpoints in an aircraft should be designed congruent to the airline's brand values.

## So what should an airline smell and taste like?

As the airline business is a service industry, multisensory branding of course tackles service design, including on-board services such as food and drinks.

Well-known chefs have a signature dish, a dish that makes them recognisable and is the reason why people come to their restaurant. This could be interesting in first class.

For example, Iberia is already selling chorizo and rioja in economy class, but they could emphasise even more on the Spanish culture through on-board services, CMF, music and inflight entertainment. Everyone who likes Spain will probably enjoy the first small glimpse of the Spanish art of living. For tourists, holidays would start at their hometown's airport.

And there are many ways to enrich a flight: Lufthansa stewardesses for example could wear Dirndls (traditional Bavarian clothing for women) on flights to Munich during Oktoberfest and hand out pretzels, creating an experience everyone will remember.

## Do any airlines currently have a smell or taste – even if unintentional?

Airlines struggle with toilet and kerosene smells, but also materials in the aircraft interior often emit odours, which are sometimes hazardous for passengers and crew. We are not talking about putting a scent in the cabin to cover the uncomfortable or dangerous smells. Materials themselves can be chosen carefully to either minimise hazardous evaporation or to give a memorable natural fragrance. The car industry is pioneering in material research for interior design.

Today, branded scents are, for example, used by Apple. Its products can have a very distinctive scent.

"That's the power of our senses: familiar scents, such as granny's apple pie, make us feel at home and safe"



Whenever unboxing a brand-new Apple product, we are confronted with the same, barely perceptible smell of 'technical competence', reminding us of former Apple products we owned and loved. The same scent ensures that we fall in love with the new product right away. That's the power of our senses: familiar scents, such as granny's apple pie, make us feel at home and safe.

## Such senses can be very individual. Isn't it safest for an airline to aim for neutrality in terms of feel, taste and smell?

Remember the signature dish. You do not have to eat this dish; maybe it contains something you do not like. But the restaurant stays Italian, for example. Would you recommend that the restaurant should also sell sushi and schnitzel, to meet everyone's gusto?

## You mention the "taste of BMW" in your presentation. What does BMW taste like?

Dark chocolate with candied ginger and fleur de sel.

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## TECHNOLOGY

Stand: 6C108

### Advanced configuration software

PACE will be demonstrating the latest version of its flagship product: Pacelab Cabin 7. This all-new generation of the aircraft and cabin configurator – release 7.4 – uses many insights gained in industrial use in the past years – for example for the A350 XWB programme – and now supports all aircraft types, from corporate jets to large multideck commercial aircraft.

Along with major upgrades in 3D imaging and monument configuration, the largest functional additions in release 7.4 are the enhanced central data management and user management capabilities. The data management feature allows the integration

of all catalogue and project data into one central server-based repository in support of the entire lifecycle of the aircraft. Access to configuration data and functions is controlled by a fine-grained user management system, ensuring permanent availability of validated, up-to-date product data, and thus facilitating the collaboration of geographically dispersed teams.

The application has been specifically designed to engage customers more directly throughout the sales and customisation process, following strong demand for a new style of aircraft sales and marketing tools.



Software such as Pacelab Cabin 7 helps teams around the world collaborate on a single design project

Stand: 6A89

### Cool news

Ametek Rotron will be introducing a tubeaxial cooling and ventilation fan with the highest performance in the industry for its package size. The MIL-XTM Extreme Performance Series fan delivers 300cfm at 1.5iwg (inches of water gauge), a claimed 24% increase in airflow over previous models with the same package configuration. Operating at 7,500rpm, the fan delivers up to 42% efficiency, an increase over a typical tubeaxial fan efficiency of 27%, according to the company. Standard features include shock-proof construction, immersion and wash-down capability, over-voltage and reverse polarity protection, and locked rotor shutdown with automatic restart.

DON'T MISS  
THE CRYSTAL  
CABIN AWARD  
RESULTS ON  
9 APRIL

Stand: 6D51

### Virtual interior fit checks

A virtual reality suite of software being unveiled by Optis has been created to accelerate the various phases of the aircraft interior completion process. The system uses a 3D digital mock-up, which can be visualised into Cave Automatic Virtual Environment (CAVE), to test fit, appearance, functionality and human-machine interface. It allows furniture to be computer designed and fit-tested prior to installation.

Designers and technicians wear 3D glasses and enter the CAVE, whereupon human movement alters the 3D physics-based image projections in real time to simulate the changing views of flyers as they move through the cabin.

The system brings the aircraft cabin model to a level of detail that is efficient in term of ergonomics and visual ergonomics so it can be checked cost-effectively. Precise shapes and

very detailed physics-based renderings are projected into the CAVE walls, and the model verifies the shape, colour and function. Using the technology, engineers and designers can check geometry, function and aspect, answering questions such as "Can you open a door?", "Did you choose the right material?", or "Does maintenance have enough room to work on things in a cabinet?"

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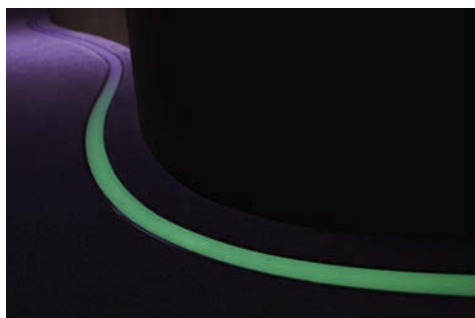
## TECHNOLOGY...



## Stand: 6B60

## Floor marking system

Lufthansa Technik will be displaying GuideU, an easy-to-install, non-electrical floor path marking system, exclusively produced by Lufthansa Technik. Designed to fit in any cabin, GuideU combines safety with high design standards, and offers high reliability with maintenance requirements. As the system consists of just two components, it saves spare parts and operation costs, and is claimed to offer weight savings of at least 15% compared with some other systems. GuideU is available in 18 different colours, to match any cabin design.



## Stand: 6D60

## Cutting-edge design software

Altair Engineering will be presenting the latest version of its HyperWorks CAE suite and its Inspire concept design tool. HyperWorks is an open-architecture CAE solution that includes modelling, analysis, visualisation and data management solutions for linear and non-linear, structural optimisation, fluid-structure interaction, multibody dynamics, and CFD applications. The tool enables users to create and investigate structurally efficient concepts. Traditional structural simulations allow users to check if a design will support loads, and Inspire enhances this process by generating a new material layout within a package space, using loads as an input.

Altair will also present software and services offerings in the area of lightweight design, optimisation and composite design, demonstrating the implementation of lightweight strategies via optimisation centres, and the awarded development process.



## Stand: 6D20

## Double launch at Vision Systems

Vision Systems will be showing two innovations: VisiStream, a solution for IFE and connectivity; and Energia, a self-powered dimmable window.

VisiStream consists of a single box with a new module, allowing for AVOD connection from up to 100 PEDs simultaneously, providing satcom connectivity for internet and emails (through a Satcom 1 receiver), and a moving map. The system also enables the sending of information to PEDs, with

priority data flows for safety videos or announcements. Options include media content update via wi-fi and a real-time digital video surveillance system.

Meanwhile, the dimmable window can produce its own energy from the sun thanks to WysipsGlass technology, which consists of transparent photovoltaic cells integrated into the glazing that allow energy storage in a battery to provide the dimmable window with electricity.



Photovoltaic cells integrated into the glass mean these dimmable windows are self-powered



## Stand: 6.1A10

## Seat electronics tester

An aircraft seat electronics tester will be launched by Sinters America. For airlines, non-operational seats are extremely costly and a source of customer dissatisfaction. The tester is intended to speed up aircraft cabin interior maintenance, resulting in better passenger experience and satisfaction.

The unit allows full functional testing of an aircraft seat or row in minutes, including IFE, PCUs, in-seat 115V outlets, power jacks for portable devices, and much more. The product is compact and rugged, allowing for use either on or off an aircraft. Either plugged-in or battery powered, the tester provides power to the seat or row, and thus does not require GPU or APU power.

The tester is composed of two units: a test controller, which is installed under the seat; and a remote control unit. The test controller contains all the intelligence, inputs and outputs required to execute the test, while the remote control unit – a tablet PC – wirelessly controls the sequencing of the test steps and displays results in real time.



X

TECHNOLOGY...



Stand: 6C50

## Virtual seat prototyping

ESI's Virtual Seat Solution is designed to support complex seat design by providing multidisciplinary teams with the possibility of working on the same virtual prototype. Each engineering team can see the same model from a different perspective, according to its specific constraints, and seat certification can be virtually evaluated to ensure the success in certification. Passenger comfort, living space and accessibility can be predicted on

several seat variants and for different passenger anthropometries, and manufacturing of seat composite frames, sewing of covers, and durability issues can also be managed.

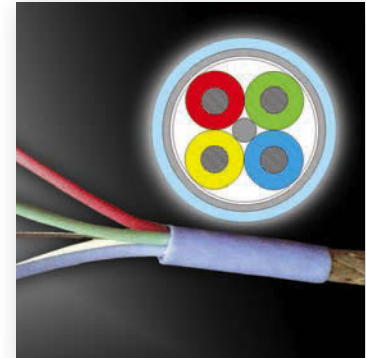
Early in the development process, prior to prototyping, teams can assess trade-offs, taking into account highly different constraints. Coupled with the Virtual Reality platform, it is possible to interact in an immersive way in a cabin to better experience a seat's behaviour.



Stand: 6D60

## Lightweight data cables

Star-Quad KL24 data cable is up to 25% lighter than previous types of quad cables, says its creator, Draka Fileca (Stand 6D60) – while retaining the same diameter and identical transmission properties. For its A350 aircraft, Airbus charged Draka Fileca with the development of a cable for digital data transmission. The cable not only had to enable high transmission rates, but also had to be much lighter than the previously used KD24 type. The KL24 data cable complies with the requirements of EN 3375-011 for electric cables for digital data transmission in aerospace. It will initially be used in the A350, and there are plans in the near future to extend it to the A380 and all other Airbus platforms. By replacing existing data cables with the KL24, Draka Fileca claims that the weight of an A380 can be lowered by up to 85kg.



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Stand: 6E48

## LED power supply

TDI Power will be introducing an innovative power supply ideally suited for aircraft LED lighting systems. Packaged within the traditional ballast form factor, the product enables replacement of legacy fluorescent tube lights with efficient LED solutions. Packaging constraints, along with rigorous commercial aviation qualification standards, presented significant design challenges. These were met through extensive use of surface-mount components, along with flexible PCBs, delivering a highly compact and lightweight product. TDI Power's solution has been incorporated into the HelioJet LED cabin lighting product from Schott and Lufthansa Technik.

Stand: 6C19

## Lighting connectors

TE Connectivity's new Deutsch 369 series connectors (Stand 6C19) have received qualification from Boeing under standards BACC65CP and BACC65CR, and can now be used for cabin lighting. This range of reliable, lightweight, compact and cost-efficient connectors is ideally suited to harsh aerospace environments.

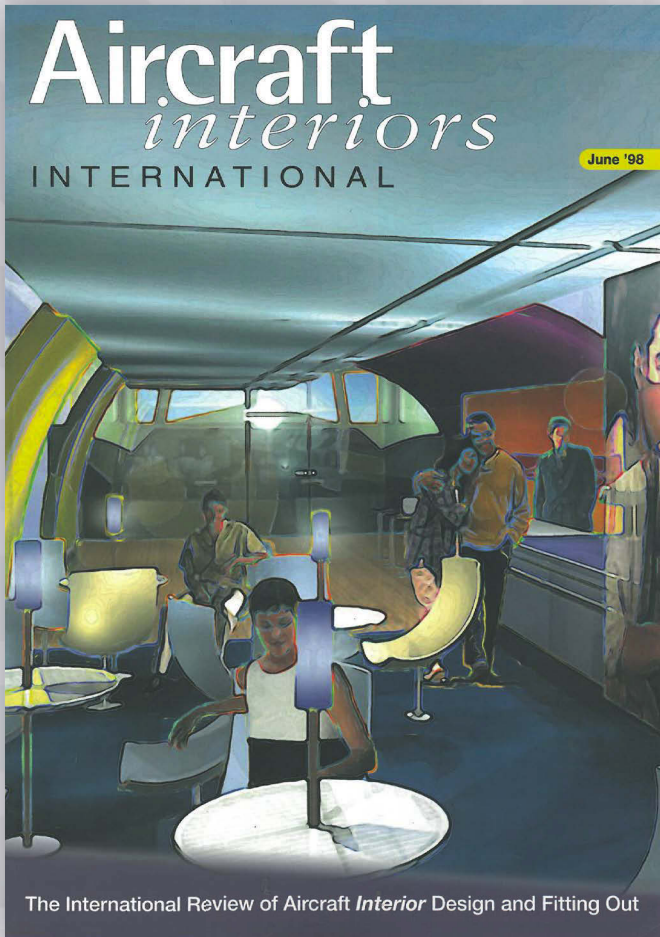
The series is suitable for civil aerospace cabin systems applications and has been designed to meet tightening industry regulations and Electrical Wiring Interconnect

Systems (EWIS) best practices. Its improved installation features include colour coding for quick ID and install, positive button latching/audible click, and simple cable-tie mounting with latch-defeat mechanism.





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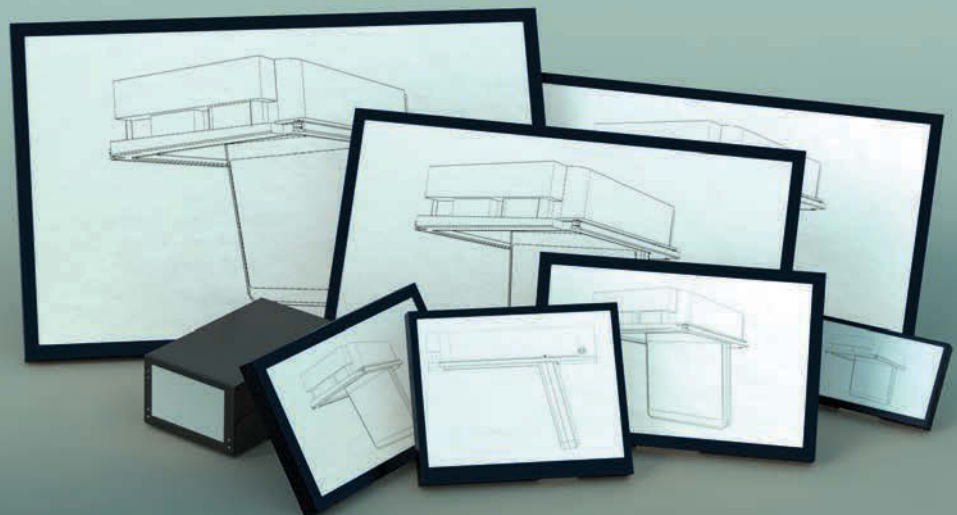
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Stand: 6.1A20

## How to boost ancillary revenues

“Everyone makes money from air travel except airlines,” says Arconics. However, as US drugstore giant Walgreens has demonstrated, a mobile strategy can change the game. Research from 8,300 of its stores found that customers who are engaged on mobile and online spend six times as much on every visit as store-only customers, and nearly twice as much as online customers.

Arconics’ CloudStore system does the same thing for airlines. CloudStore goes beyond streaming IFE to deliver targeted value to passengers at the right time. Combining IFE, pre- and post-flight information, offers, and reservation and bookings into a single app delivers higher engagement. This translates into higher ancillary revenues before, during and after the flight.



One of Skyline IFE’s creations: Nora, Norwegian Air Shuttle’s safety star, has a matched safety card

Stand: 6D30

### Bluebox seals Bangkok Airways IFE deal

Bluebox Avionics has announced that Asia’s leading regional carrier, Bangkok Airways, has introduced its Bluebox Ai portable IFE solution across select services. Using the iPad mini as a platform, Bluebox Ai provides the airline’s business-class passengers with access to a wide range of movie content including the latest Hollywood releases. Bluebox Ai also delivers a catalogue of movies, TV, audio and interactive games.

Puttipong Prasarttong-Osoth, president of Bangkok Airways is delighted with the system and the timing of its introduction. As he states, “We are excited

to introduce this award-winning portable IFE system to our passengers. Delivering an outstanding passenger experience is at the heart of our ethos and what better way to demonstrate this than our latest investment which will deliver a powerful and engaging IFE experience.”

David Brown, joint managing director of Bluebox Avionics adds, “Bangkok Airways has operated a portable IFE service for several years so it has very clear expectations of the system, both today and for the future. We are delighted that Bangkok Airways selected Bluebox to meet these needs.”

Stand: 6.1A29

## Safety first

IFE content producer and service provider Skyline IFE will be bringing together safety video and safety card production in a low-cost package. The media is produced from the company’s in-house library of commercial aircraft CGI assets by professional artists and management staff with over 15 years of experience in airline safety media production. With this product, airlines with a new aircraft type on order are able to receive customised brand-matched card and video media prior to aircraft delivery, thereby ensuring safety media is available before entry of the aircraft into active service.

Airlines with aircraft in operation carrying safety cards that do not match the video in style or branding

can take advantage of the low-cost solution to replace mismatched products with a brand-matched safety media set.



## In other IFEC news...

Stand: 6D60

P3 Voith Aerospace is bringing ‘green cabins’ closer with the introduction of a weight-saving cabling system. Visitors to last year’s expo were introduced to the new ‘Rau-Flight PA’ material from polymer specialist, Rehau, which is claimed to save more than 10% in weight compared with other commercially available thermoplastics with similar mechanical properties. A year down the line, P3 Voith is planning to offer the first complete cabling system using this innovative material. Using this system, all cabling systems found integrated in cabin floors, which usually support the supply of the audio and video signals for the seats, can be realised on and in the seating rails. Integral elements are the raceways for the lengthwise connections and the bridges for the cross-connections between the seat rails. Classic covers for the rails will be available in more than 20 colours, and a flatter model of the covers allows for flat installation of flooring.

Stand: 6.1A30

Lock’n’Charge’s 2014 Aero Range will be revealed, including the iQ30 Aero and iQ60 Aero trolleys, designed for onboard iPad storage for airlines offering tablet-based IFE. The iQ60 Aero can store, charge and sync up to 60 iPads, while the iQ30 Aero can do the same for 30 of the devices. The technology offers crews an easy-to-view operating state display. To manage devices off the aircraft, the iQ 16 Sync Charge Box can sync and charge 16 iPads, saving time by charging all devices in around the same time it would take to charge one. The EVO 40 Tablet Cart can store, secure, transport and charge up to 40 devices.



Stand: 6C10

IFPL will be showcasing its latest IFEC product design and demonstrating how you can Break Free, Charge, Pay Up and Go!

Break Free! is a breakaway jack that solves the problem of broken headphone plugs. Leading on from the single-pin jack, the Breakaway Triple Jack (1272) is a new concept for use with powered noise-cancelling headsets and requires no physical modification to the seatback. Meanwhile, Charge! is a standalone USB outlet with 2A output; Pay Up! is a contactless retail system using NFC; and the Go! self-testing jack enables quick and easy visual system audio check, verified at a glance.



## IFEC NEWS

Stand: 6.IA21

### App for whole travel experience

Stellar Entertainment will be demonstrating its Home2Hotel: Connect software application. The app, available for iOS and Android mobile devices, is designed to help airlines stay connected to their guests in their own branded ecosystem by providing media content and other services and information relevant to their guests throughout the journey, inspiring value and loyalty to the airline by repeat visitation to the airline ecosystem.

Content available for the app includes video, audio, e-publications via PressReader, shopping, menus,

survey data and concierge services including payment fulfilment as required. The ecosystem and content are customisable for each deployment, as required by the airline.

Michael Reilly, COO for Stellar, explains, "Our Home2Hotel app is designed as part of our holistic service approach. We have said for some time that the IFE experience does not begin and end at the aircraft – and we are pleased to see that our airline clients agree and are embracing the possibilities of staying connected to their own customers throughout their journey."



On a flight from Los Angeles to London, an aircraft could generate up to 500MB of data

Below: The connected aircraft concept

Stand: 6D38

### Connectivity soars

Passenger communication is just the beginning of how inflight connectivity can be used. A350s and B787s, for example – are flying data centres. On a flight from LA to London, an aircraft could generate up to 500MB of data. How can airlines exploit that data fully? OnAir will be discussing e-Aircraft and how the connected aircraft could enable connectivity applications not just for passengers, but also for flight and crew operations, aircraft maintenance and passengers. This will improve the

flying experience, improve service and efficiency, and improve aircraft efficiency, says OnAir.

The e-Aircraft is designed to enable crew to operate in a paperless environment, and connectivity can be used to enhance service. Using connected tablets, a passenger could be rebooked; maintenance crew can be on hand with the right tools to fix a problem reported during the flight; and non-flight-critical data can be updated during flight.



## In other IFEC news...

Stand: 6.IA19

PressReader, a multichannel newspaper and magazine content distribution specialist, will introduce an offline digital newspaper service, designed for use in IFE systems. Businesses can customise their library of publications on an offline server and make the publications available to passengers, who will be able to access



thousands of full-content digital newspapers and magazines on their personal devices. PressReader Offline complements digital and print newspaper services that are available with airlines and in lounges.

Stand: 6A20

DTI can help passengers explore their more playful side through the launch of four new in-seat games: Leaf, a casual game; Weather Rush, a puzzle game; and two other touchscreen and handset-compatible games named Polterghost and Tennis Showdown. DTI is also enhancing its wireless content portfolio with a new wireless games portal designed to detect the type of passenger device, and deliver compatible games from DTI's catalogue of wireless inflight games.

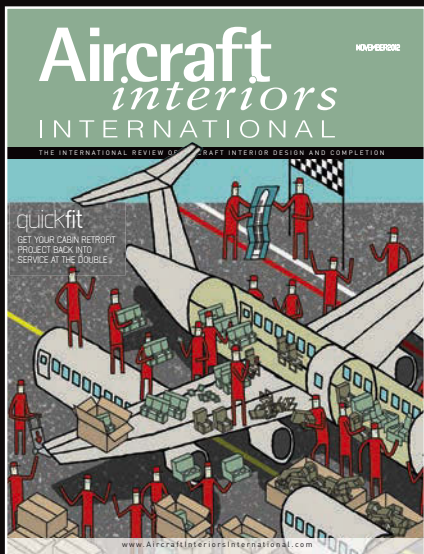
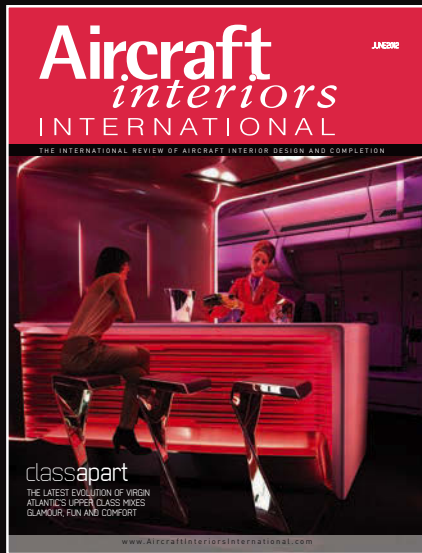
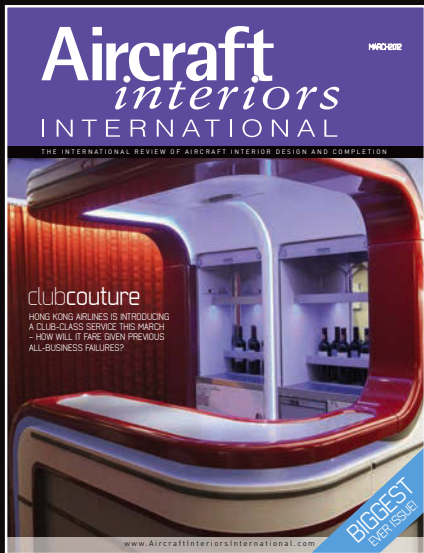


Stand: 6B60

Lufthansa Technik's Innovation business unit will be presenting the first ultra-fast (802.11ac, 1.3Gbps) wireless access point (acWAP) with internal antennae, based on the latest developments from Aruba Networks.

The solution is designed to offer airlines the ability to deliver high-speed wi-fi for inflight web browsing, multimedia streaming, real-time communications, point-of-sale applications, passenger gaming, and other internet-based services.





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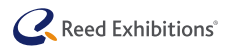
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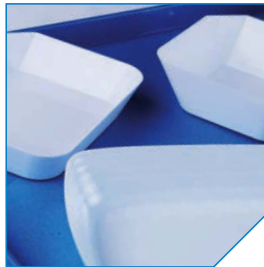
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WORLD TRAVEL CATERING  
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PREVIEW HIGHLIGHTS



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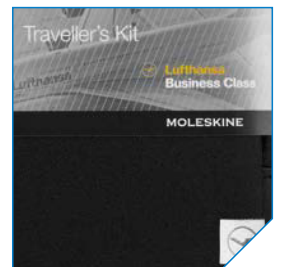
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# All in good taste



Just a taster of some of the exciting new products and services you can expect to see at World Travel Catering & Onboard Services Expo

Stand: 4A20

## Ambient culture

FlyFit has developed a new yoghurt that the company believes could be one of the 'hottest' items at the show as it is a breakthrough in meeting airlines' "no waste rules".

A special production method, developed with Wageningen University in the Netherlands, means that this healthy yoghurt has a shelf life of six months when stored at ambient temperature – and this is without the use of any

preservatives or artificial sweeteners.

This means airlines can have much less product waste and the vitamin-rich yoghurts can be stored easily in galleys. The product weighs 100g and can fit in any snack box or tray placement.

FlyFit is exhibiting at the gategroup booth (gategroup is one of its distributor partners).



Stand: 4J51A

## Deli delights

Furlotti & C. has been a manufacturer of quality deli meats and time-saving products for over 50 years. The company has created a product range dedicated to on-board catering, with a new way to enjoy delicious meats and cheeses on a train, plane or ship.

The Italian company will launch this range at the expo, with new products including: mini snacks, which include a serving of salami, strolghino, mortadella, ham, bacon and others; and cheese snacks, which are portions with cheeses accompanied by fruit jam. All are packaged to be suitable for travelling gourmets!

Furlotti & C. is aware of problems related to food allergies, so all its products contain herbs, spices and only natural flavours, and are free of sources of gluten, lactose and milk proteins (caseins and whey proteins) polyphosphates and glutamates. The new On-Board Catering range is also available as a private label offering.



Stand: 3B30

## New shapes

Global Inflight Products (GIP) will be presenting new designs for disposable dishes using different materials such as PS and CPet, which offer a polished and clean look. The dishes, with a unique twist on rectangular shapes, enhance meal presentation and are also lightweight, stackable and ergonomic. GIP is also showing porcelain tableware in organic shapes for first or business class, with a flowing appearance to provide a sophisticated background to meal service. This porcelain is durable, chip-resistant, easy to clean and fully customisable to include a logo or design.



Stand: 4H30

CRANTOCK will be exhibiting at the WTCE show for the first time, and will be focusing attention on its ability as a manufacturer to bring savings to the supply chain. The company's existing product range includes savoury rolls and duo boxes (savory and sweet combination pack), but at WTCE it will be demonstrating the range of flavours that can be found in its new hot, handheld wraps. These snacks are on sale in UK major multiples under the Greedy Gecko brand, and are now being made available to airline caterers as either buy-on-board or as giveaways in a smaller size format. The Greedy Gecko brand is one of many sub-brands offered to the sector by Crantock, providing flexible solutions for all meal opportunities in airline catering.



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Stand: 4A20

### Contemporary serviceware

As the leading independent global provider of products, services and solutions related to an airline passenger's onboard experience, and the largest exhibitor at WTCE 2014, gategroup is delighted to present some of its newest and most exciting products and concepts at Hamburg this year.

Future design is taking shape right now at deSter, a gategroup company. deSter is a leader in food presentation concepts and onboard service equipment, including space-saving and lightweight solutions combining aesthetics and functionality.

On display at WTCE 2014 is Japan Airlines' new economy-class equipment, developed jointly with deSter. The unique design is inspired by Japanese food, with geometric styling. Square shapes with a slim red rim around

the borders add sleekness to an otherwise minimal design.

The handle-free tea cup represents the red circle in the Japanese flag, bringing alive the overarching Japanese theme. The extra-long plate also doubles as a tray for a snack or coffee service. Placing the bowls on the plate also reduces the chance of sliding on the tray. The elegant and organised multipurpose tray set enables the Japanese flag carrier to connect better and surprise its passengers with an exciting way of serving quality meals.

This is just one of the many exciting products that will be on display by the gategroup brands at WTCE 2014. Visit gategroup's 500m<sup>2</sup> stand and witness how the various brands work together to offer an end-to-end portfolio of products and services in onboard hospitality that excite, inspire and engage.

gategroup  
boasts a  
massive 500m<sup>2</sup>  
stand



Stand: 4D50

HARVEY ALPERT will be introducing visitors to iFood, the company's most recent global expansion initiative. Harvey Alpert & Company, founded in 1977, represents food and beverage manufacturers in North America, specifically those involved in the travel industry. With iFood, the company has broadened its reach to Europe, providing high-calibre sales, marketing, planning and logistics management services. A dedicated team of sales executives

based in London, Frankfurt and Rome work with well-known manufacturers as well as innovative new companies to bring relevant products and first-in-class support services to the travel channel. Launch product lines include standard and custom-made frozen snacks (hot and cold bakery goods; condiments; ambient, chilled and deep frozen boxed snacks and meals; and salty snacks (packaged and bulk).

Stand: 4B50

### Set and match

Linstol has extended its range of headsets by creating a new concept for noise-cancellation headsets, giving airlines an opportunity to specify the colour and materials of up to 12 visual parts of the product.

This opportunity can result in unique, specially detailed headsets that align with an airline's brand and enhance the passenger experience.

Each individual headset - from the 225 or 250 model range - is crafted from quality materials to ensure exquisite sound reproduction, complemented by advanced noise cancellation.

The robust quality of the headset will increase its life and enable repeated use, thereby improving cost effectiveness without loss of quality or reliability.



Stand: 2D30

GUT SPRINGENHEIDE will be presenting its new egg creations, including polenta and spinach-filled eggs, and chive-egg rolls. The dishes are perfect for breakfast, starters or as side dishes. Also new in this egg specialist's offer is a crêpe filled with an aromatic leek, mushroom and carrot filling, which weighs 60g. The egg products are in line with the trend for meat-free alternatives. They are non-industrially manufactured in the Gut Springenheide factory without preservatives, colourings or flavourings. Gut Springenheide can also fill eggshells with praline chocolate, and can offer brightly coloured nougat eggs attractively presented in fine multicoloured packaging, or even natural eggshells filled with delicious crème brulée and other tasty treats.



Stand: 4C54

## Journey of experiences

LSG Sky Chefs is no stranger to international cuisine. A key part of its heritage and rich diversity is in North America – the culinary melting pot of the world – where nearly 40 of its highly trained chefs, representing over 15 countries, prepare menus for the world's elite international airlines, every single day.

This experience will cross the Atlantic at this year's WTCE as the company celebrates the international spirit and pan-regional cuisine that have made it – and America – famous over the years. Guests can look forward to daily live show cooking and hands-on hospitality at the LSG Sky Chefs booth throughout the event. Prepare menu items with the company's Culinary Excellence team, whose 'no limits' approach to airline cuisine will have everyone talking – at least when they're not eating!

In between bites, take a journey through the company's latest concepts in retail management, equipment and logistics, product design and lounge management. Learn how global megatrends continue to exert their influence on product and service developments.

With fascinating insights and its international spirit on-hand, LSG Sky Chefs looks forward to welcoming guests on a journey of new experiences in Hamburg.

LSG will be hosting live cooking demonstrations



Stand: 4H28b

## Mediterranean snacking concept

Pelopac has developed an authentic Mediterranean snack concept – now available to travellers who are looking for a substantial snack or mini meal without loading up on unhealthy foods.

Each convenient little box contains a portion-size tub of dip plus a small bag of crackers.

Fully ambient, the boxes require no refrigeration and have a shelf life of 12 months minimum (18 months for dips) – with no artificial preservatives and no compromise on taste or authenticity.

The product can be customised to create a unique product for your target market – simply choose a savoury cracker to go with one of the Mediterranean dips (for example roasted pepper and feta, babaganoush or hummus).

The concept is available under Pelopac's Flavors of Greece brand,

but can also be developed for own-label products – as was done in the UK, where Karyatis Meze To Go was launched in October 2013.



Stand: 2C71

## Direct approach to textiles



As a pioneer of direct factory supply to the travel sector in the 1990s, Mills Textiles is pleased to announce it is keeping this initiative going by offering customers a bespoke factory direct design function

for textile and comfort product supply.

Tim Morris, head of development at the company, explains, "Often with direct factory supply, the product is simply copied. There is no scope – either due to cost or inability – for design and innovation. We have an existing, in-house China-based design team for our retail business, which is now coming up with ideas for airline customers. Mills Textiles feels it is uniquely placed in the market as the design team's cost is already covered by the retail business, so customers now get even more for less cost."



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By **Jennifer Coutts Clay**

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Stand: 4J34

## Snack attack

Darling Corn are the new gluten-free corn kernels from Salty Dog, perfect for airlines. With a year's shelf life and vegetarian flavourings there is variety to suit everyone – and there are no GMOs.

Mini Darling Popcorn is ideal for sweet and savoury snacking. Available in 'salted' and 'sweet & salty', they offer the best of both worlds and only 49 calories – low in fat and with a six-month shelf life.

Darling Fruits are made with real fruit and yoghurt and are a sweet bite that is truly delicious. They have a one-year shelf life.

The 18g packs of handcooked crisps offer a light snack that is ideal with a glass of wine or beer as passengers relax into

a flight. All of the potato is used, including the skins, unlike many other handcooked crisp companies in the UK that peel their potatoes first. In eye-catching packaging and with a five-month shelf life, these crisps are already flying with some of the very best airlines.

The mini cheddars product is a light bite with a year-long shelf life.

Finally, Salty Dog pretzels are a very moreish snack. Indulgent chocolate-coated or savoury sour cream and chive, they really do taste delicious. They are suitable for vegetarians and have a long shelf life.



Stand: 4C30

## Child's play

Skysupply, Germany, will be formally announcing its new partnership with Air Mauritius, which begins this year. The goal of the partnership is to proactively develop entertaining and innovative children's products that would best fit the airline's target market. The new range of infant travel products was influenced by innovation, new technologies, trends and reusability, while ensuring an enjoyable journey for the youngest fliers and their families.

Air Mauritius will be offering children's items for two age groups. The three to six years group will be presented with a tin box in the shape of a suitcase, which contains a plush plane, a baseball cap and a magic board, as well as a crayon set, travel diary and a colourable postcard set to keep them entertained. The product suite for seven to 12 group features a crossover bag in bright colours, containing a baseball cap, puzzle cube, postcards as well as activity games such as river-town-country, wonderkid and high five. These fantastic amenities for kids will be a blessing for parents in keeping their kids occupied and happy on flights with Air Mauritius.

Based on the experience of Skysupply in character design and creation of children's travel products, the new Dodo character – the extinct bird that lived on Mauritius – has been designed for Air Mauritius to give children a character that they can identify with the airline.

To help Air Mauritius address and differentiate the various age groups,

Skysupply's design team has focused on developing age-specific Dodo characters. For children aged three to six, it has created a younger version of Dodo, hopping around on a white beach, while for the seven to 12 group Skysupply devised a cooler and more grown-up version of Dodo on the beach, complete with surfboard and floral shirt.



Stand: 2B73

JULES DESTROOPER is a Belgian Certified Purveyor of biscuits, but that status has not been without its drama. The abdication of Belgium's King Albert II in 2013 automatically brought an end to his recognition of Certified Purveyors. On 15 November 2013, His Majesty King Filip (the seventh and current King of the Belgians) recorded the first list of Certified Purveyors under his reign. That list contains 111 companies that bear the official title of Purveyor to the Belgian Royal Household. Biscuiterie Jules Destrooper was delighted that the new monarch has granted the company that special privilege and that it remains part of a select hand-picked group of companies and consider it the highest form of recognition, appreciation and confirmation for the premium quality that the company pursues on a daily basis.



Stand: 4E15

## Ovenable halal meals

Tops Foods is aiming to revolutionise the airline market with ovenable, “fresh made”, ambient halal ready meals and meal box solutions. The company hopes that when passengers order items from the Tops menu, they will be surprised to learn that it was not freshly made.

The story becomes even more exciting when you find out that this is not a fresh meal, but a meal that can be stored at room temperature for several months, so no freezing or chilling is required – and this is achieved without using preservatives, flavour enhancers or artificial colourings.

Belgium-based Tops Foods, a supplier of ambient ready meals to the European Private Label Retail Market since 1993, is really trying to break

through all the traditional values in the airline market.

Since 1993, the accredited halal factory has been sterilising millions of ready meals every year using a unique and patented sterilisation process. The process is so fast and precise that the meal looks, smells and tastes like a fresh meal, and even the consistency is amazing.

Imagine if you could fly on zero waste and simultaneously improve the passenger experience of the meal offered by your airline. That would really revolutionise the airline business!



Wild Maine blueberry jam is made from hand-raked blueberries

Stand: 4H51

## A bit on the side

Speciality food creator Stonewall Kitchen offers quality products to suit a wide range of tastes and cultures, which are perfect for onboard catering.

To help turn simple dishes into something special, try Stonewall Kitchen’s Apple Cranberry Chutney, Mango Chutney and Old Farmhouse chutney. Robust in flavour and loaded with fruit, herbs and spices, they complement cheese plates and dishes made with pork, chicken or turkey. Try them on a sandwich for a great twist on a traditional lunch.

Another unique, versatile and extremely flavourful pantry item is the Hot Pepper Jelly. It is sweet and

spicy and adds great flavour to Asian dishes, pan sauces and stir fries. The award-winning Maple Chipotle Grille Sauce is crafted with fiery chipotle peppers and adds a distinct savoury flavour to grilled vegetables and meats.

The Roasted Garlic Onion Jam combines slow-roasted garlic, sweet onions and balsamic vinegar and is great for making appetisers, entrées and sauces. If it’s time for a ketchup upgrade, the Country Ketchup has an enhanced spicy flavour that perks up more than just hamburgers and French fries.



Stand: 4K35

INAUDI will be showing an innovation in the field of truffle products, with the launch of Attimi di Tartufo (Truffle moments) – a single-serving of olive oil. The product is a system of single-dose bags of three Inaudi products: Condimento Il Tartufato Bianco (white truffle flavoured olive oil), Condimento Balsamico al Tartufo (balsamic vinegar with truffle), and Miele di Acacia con Tartufo (Acacia honey with truffle). The main feature of these single doses is their handiness. With a simple action of the hand, it is possible to pour the contents over a dish without wasting any or getting it on your fingers: no mess, no waste. These single-serving portions allow passengers to taste truffle seasonings at any time.

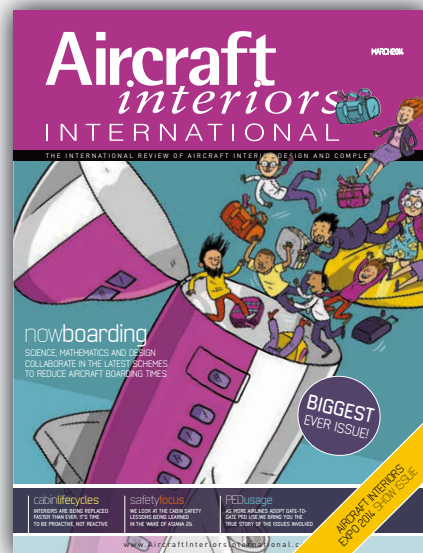


Stand: 4B51

FALKON GLOBUS’S Etzio range is intended to help passengers find the best comfort and design to make journeys more enjoyable and fun. The bags collection is specially designed to make a trip as easy as possible while still following the latest fashion trends. Etzio is for those who love travelling, and will fill their pack with a collection of city maps and brief guides from around the world, and other accessories such as eye masks and passport holders. Thanks to its three design teams in Hong Kong, Barcelona and Istanbul, Falcon Globus can offer useful ideas, taking into account all cultures and tastes. The company’s designs are characterised for being personal, energetic, revolutionary and green – eco-friendly materials are used for all products whenever possible.



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Stand: 4H43

## Front roe

Caviar is a great treat. But there is a downside: the sturgeon is killed to get the roe out of the body (the sturgeon usually bleeds to death). Of course, fish are also killed to get the meat, but it is different with the sturgeon: the 27 species are threatened with extinction – and this is a creature older than the dinosaurs!

This approach does not fit into the demands of a modern responsible lifestyle – this is what professor Angela Köhler of the Alfred Wegener Institut for Marine and Polar Research in Bremerhaven, Germany, felt when she was shown a caviar harvest in Iran. The sight made her decide to research a process for gaining premium caviar without killing the precious animal.

To put it in a nutshell, professor Köhler managed what generations of caviar experts – especially in Russia – were looking for: a process that yields premium caviar but does not harm the sturgeon. The process is marketed using the newly founded Vivace GmbH.

Furthermore, USPs have also been found: When taking the eggs out of the body, they are full of follicles and blood – a paradise for bacteria. Therefore classic caviar either has a very short shelf life (and is not available later than summer, as the harvest is usually in spring) or one needs aggressive preservatives such as borax. Vivace sturgeons give their roe basically like they do in nature, where the sturgeon itself 'cleans' the egg. Therefore Vivace roes are cleaned by nature, which gives them a shimmer, a large and regular shape, and means no preservatives are required, while still giving a long shelf life. This long shelf life also allows the caviar to be matured until its full richness is developed. As Vivace harvests throughout the entire year, clients can have caviar whenever they need it.



Stand: 2B30

## Amenity kit awards

On the heels of a banner year, Wessco International, a global supplier of branded amenities and comfort items to the airline industry, has submitted several of its recently launched kits for competition in the 2013 TravelPlus Amenity Bag Awards.

Focusing on innovation, design, brand compatibility and the needs of the traveller, Wessco International introduced a number of stylish amenity kits together with its valued airline partners in 2013. Collaborations with Air Europa, ANA, China Eastern, Etihad, Iceland Air and Jet Airways yielded a collection of stunning kits (filled with the most desirable branded cosmetics) for men and women in several classes of travel.

Submissions to the 2013 TravelPlus judging panel include ANA's latest

The amenity bag winners will be announced on 8 April

business-class offering (with L'Occitane cosmetics), the new first-class unisex kit from China Eastern (with a Ferragamo Pouch and Ferragamo cosmetics), American Airlines' current first-class unisex kit (with an Eames Pouch and Dermalogica cosmetics), Etihad's current male and female first-class kits (with Le Labo cosmetics), Jet Airways' male and female first-class reward (with Korres skin care products), and finally a practical, beautiful and earth-inspired gift-pouch for Icelandair's business passengers (featuring Icelandic niche brand Blue Lagoon cosmetics and emulating the country's geographic beauty through fabric and colour).

Winners will be announced at an awards ceremony on Tuesday, 8 April 2014, at the Radisson Blu Hotel in Hamburg, Germany.



Stand: 4G20

DFMI will be attending as an exhibitor for the first time in 2014. "We believe WTCE will provide a great opportunity to showcase our capabilities to high-calibre visitors and distinguished exhibitors in Europe," says Graham Felton, CEO of the company. DFMI will present its new European partner's products, created for premium and economy, which range from hot entrées, sandwiches and snack boxes, artisan and pretzel breads, Belgian chocolates, mineral water and serviceware items.

Stand: 2C30

HOPPE will be showing several new products from its Minibite brand. A range of four 'made in USA' cookies will be available to sample, and continuing the American theme, the company has also teamed up with AMI Inflight for sales and distribution of the USA cookies for North America. Minibite had a very successful 2013, and will be looking to add yet more clients to its list. In 2013, new customers included Lufthansa, Airberlin, Easyjet, Norwegian, British Airways, Brussels Airways and Virgin Trains.



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Stand: 4H20

Sweet ideas

American Muffin Company is pleased to announce the launch at the World Travel Catering Expo 2014 of its range of muffins in cups and mini loaf muffins for the travel industry. The range of flavours will include double chocolate chip, blueberry and chocolate chip muffins. The many flavours of muffins, cookies, cakes, brownies and flapjacks are offered by the company in different sizes and formats to cater for different occasions.

American Muffin Company is also a leading supplier in the UK and Europe of gluten-free, egg-free, lactose-free and sugar-free muffins and cakes to major supermarkets and caterers. The goods are individually wrapped in single portions and kept at ambient temperatures.

The new 'high street' appeal branding and packaging design is intended to deliver an excellent onboard consumer experience.



Stand: 4B11

Gourmet chicken dishes

One of the last places you'd expect to be served chicken romesco, a spicy, nutty dish that hails from the Catalonia coast in Spain, is in the seat of an aircraft cruising at 35,000ft. That may soon be a reality, as Cuisine Solutions, an on-board service industry provider of sous-vide prepared food, will soon begin offering not just chicken romesco, but chicken adobo, marinated pork belly, smokey lima beans with bacon and seco sauce, and a Peruvian cilantro sauce to their airline partners in 2014.

The company also offers halal-certified sous-vide dishes to customers in the Middle East. Cuisine Solutions will be announcing details for all of the new products at the expo.

"One of the big trends in airline cuisine right now is culturally focused food – dishes inspired by the airlines' exotic destinations,"

says Gerard Bertholon, Cuisine Solutions' chief strategy officer. "Consumers are interested in exploring ethnic flavours and textures, so we're continuing to develop bold and exciting dishes with that in mind."

Cuisine Solutions brings more than just food to the skies – two of its chefs participate in United International's 'Chef on Board' programme, in which chefs help prepare and serve meals during flights. This gives crew members and chefs the opportunity to exchange ideas, which can be used to enhance future menu development.

"This program provides us the opportunity to go where our customers are and see firsthand the challenges they face," adds Bertholon. "From there we are able to continually develop innovative solutions to meet their needs."

Dishes are being inspired by airline destinations as well as origins



Stand: 2B50

yummy yum.me

En Route International's yum.me range of hot meals and side-dishes is about to become even more versatile and delicious. Following two years of research into tasty new recipes, the company's food development team has collaborated with nutritionists, international chefs and a number of manufacturers to create a choice of authentic dishes tailor-made for specific air routes, as well as a selection of meals that will work well across any airline network.

Among En Route's latest dishes is a chicken and apricot curry with jasmine rice – a mild chicken curry, gently cooked with apricots and a hint of red chilli, served with fragrant jasmine rice. Another is the popular

favourite western breakfast – a hearty grill of pork sausage and back bacon, button mushrooms, golden potato waffle and savoury slices of white pudding.

From the healthy to the downright indulgent, all dishes are slow-cooked for a fuller flavour that brings a taste of home cooking on board and, where possible, En Route avoids ingredients with artificial colours or preservatives.

For optimum safety, all dishes are heat-treated to eliminate harmful bacteria. As there is no need to refrigerate, storage is simple and reheat time is less than half of that of a frozen meal.



Great as a snack, or even as a cocktail accompaniment

Stand: 4J35

## Light bites

Madama Oliva's new product launch is the Golosita 30g daypack. The innovative packaging contains excellent Italian table olives from Sicily: ideal for both adults and kids. Golosita's characteristics are: ready to eat, no preservatives, vegan friendly, gluten free, only 55 calories, packaged in a modified atmosphere, and an 18-month shelf life. Golosita is offered in two varieties: Pitted Italian Olives (30g) and Spicy Pitted Italian Olives (30g). Both items are made with Nocellara green pitted olives cultivated in Castelvetro, Sicily. This delicious snack has an amusing packaging design and its size is suitable for both airlines and vending machines.



Stand: 4C30

SKYSUPPLY has been busy creating a new amenity kit for Air Mauritius's economy class. The main goal of the kit is to translate the positive associations and image of Mauritius – pure turquoise oceans, beautiful sand beaches as well as relaxing and peaceful holidays – into onboard well-being and comfort with the airline. The new pouch and additional camera bag come in a stylish ocean blue with a light yellow pattern illustrating shells and fish, which reinforces the sense of beach and holiday spirit. The set itself consists of socks, eyeshades, dental kit, comb, earplugs and a pen in the same ocean blue as the bag itself. The design of the bag is stylish and contemporary and encourages the passenger to go on holiday again. The kit can have a second life as a camera pouch or carry-on for mobile phones on the beach.

Stand: 3C15

GROUP SOI has created a selection of innovative condiments. The new selection of Live Oil condiments is a sensory journey of aromas and fragrances, all realised using the finest locally grown olives, pressed using only artisan methods. There are a total of 15 varieties in the range, which also includes soy sauce dressing, sherry dressing, peach vinaigrette dressing, cherry vinaigrette dressing and other brand-new flavours. Every condiment is perfectly blended, and the flavour is persistent, with a delicately smooth harmony to finish. The Live Oil Condiment Selection is available in 10ml cylindrical plastic bottles with snap open tops, and in 16ml squared plastic bottles with a twist cap and security seal.



Stand: 4C54

## Spiriant goes global

Spiriant's rich heritage and broad airline industry expertise form the backbone of the company, while award-winning designs and a unique partnership approach drive the business forward.

After a successful launch at last year's WTCE, Spiriant is taking its equipment and logistics designs global. This spring, a new Dubai sales office joins Spiriant's teams in Europe, Asia and North America in offering airline customers an enhanced supplier base, and more efficient service.

This service strategy works hand-in-hand with the company's design process, in which



creativity and inspiration play important roles in the finished product. This might begin with the sourcing of high-quality, eco-friendly materials, for example, and end with the delivery of a product that has a longer shelf life and adds value to a customers' brand.

Stand: 4E40

## Coffee to go

Netherlands-based trolley manufacturer Direct Air Flow will be demonstrating a specially designed trolley it created for Eurostar's onboard service provider, Momentum. The bespoke trolley has a built-in coffee maker, which means the operator can serve the famous Italian Lavazza coffee brand to its business premier passengers.

The trolley can be used to make a fresh espresso or cappuccino and can be independently moved throughout the carriage to each seat, offering passengers the ultimate choice of freshly served coffee.

Waste collection of the old coffee sleeves for disposal has been incorporated into the design and a rechargeable battery at the base gives the machine its power



and can be easily removed and replaced when required so the trolleys can be in constant use.

Jamie Melleney, sales and marketing manager for Direct Air Flow, will be on hand at the expo to demonstrate the trolley and to explain the challenges of its design. Momentum needed the trolley to be to the same specification as its existing trolleys yet allow for the use of the machine, and also needed it to be manoeuvrable, practical and above all offer the service provider a safe and easy way to serve coffee to its business premier passengers while next to their seat.



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# playtime

We know what you'll be doing during the day in Hamburg, but should you find yourself looking for ideas after the Expo, here are some **top fives**...

## STAY

- 1 **Atlantic Kempinski**  
Traditional glamour at its best and most opulent. With over 100 years of history and tradition, a recent two-year renovation ensures the Atlantic Kempinski remains at the top of its game [www.kempinski.com/en/hamburg/hotel-atlantic/](http://www.kempinski.com/en/hamburg/hotel-atlantic/)
- 2 **Grand Elysée**  
Offering over 500 rooms and no fewer than six restaurants, bars, and cafes, the five-star Grand Elysée hotel states that a break there results in "each night becoming an experience" [www.grand-elysee.com](http://www.grand-elysee.com)
- 3 **25hours Hotel Number One**  
Housed in a 1950s office block, 25hours Hotel Number One offers an interior inspired by 1960s and 1970s design. Awash with neon hues, this boutique hotel is a worthy addition to Hamburg's west end [www.25hours-hotels.com](http://www.25hours-hotels.com)
- 4 **The George**  
A heady mixture of British tradition with "a touch of the modern" is what The George offers. Its 125 rooms are individually finished in a range of warm colours, to soothe guests after a long day [www.thegeorge-hotel.de](http://www.thegeorge-hotel.de)
- 5 **Gastwerk Hotel**  
The converted gasworks remains a favourite of ours, offering a variety of rooms, each with a unique living experience [www.gastwerk.com](http://www.gastwerk.com)

## EAT

- 1 **Café Paris**  
Built originally as a slaughterhouse in 1882, the transition to restaurant retained most of the period features, while introducing a typical Parisian café ambience to the building [www.cafeparis.net](http://www.cafeparis.net)
- 2 **Restaurant Haerlin**  
Two Michelin stars speak volumes for head chef Christoph Rüffer and this *haute cuisine* restaurant. Completely refurbished in 2013, it retains its extensive wine cellar, which offers an unparalleled choice [www.restaurant-haerlin.de](http://www.restaurant-haerlin.de)
- 3 **Matsumi**  
Serving up a genuine slice of Asia, this 25-year-old Japanese restaurant is a truly authentic experience. Head chef Hideaki Morita returns to his native Japan twice a year for the latest delicacies and recipes [www.matsumi.de](http://www.matsumi.de)
- 4 **Se7en Oceans**  
Offering a "diverse gastronomy experience at the highest level", this Michelin starred restaurant offers the finest French and Mediterranean dishes, all presided over by head chef Sebastian André [www.se7en-oceans.de](http://www.se7en-oceans.de)
- 5 **The Bird**  
As we stated last year, "You can't visit Hamburg without tasting a Hamburger," and where better to do so than at The Bird. Using only the best quality meat in its steaks and burgers, The Bird offers up "New York sized portions," complimented by a wide selection of beers from around the world [www.thebirdinhamburg.com](http://www.thebirdinhamburg.com)

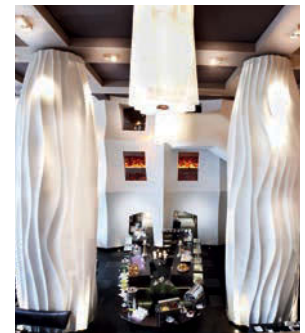
Atlantic Kempinski



25hours



East





## DO

- 1 *Airbus Factory tour*  
Need a further fix of aviation? A 2.5-hour tour of Airbus's Hamburg facility is just €14, and conveniently located at the Hamburg-Finkenwerder airport [www.globe-tours.de/betriebsfuehrungen/airbus-werke](http://www.globe-tours.de/betriebsfuehrungen/airbus-werke)
- 2 *Miniatur Wunderland*  
Though the premise might not appeal to all, the execution certainly will. This 1:87 scale model is far from a typical miniature village. Stretching over 6,400m<sup>2</sup>, with more than 13,000m of tiny train tracks, an airport, and an accurate replica of Hamburg itself, Wunderland has to be seen to be believed [www.miniatur-wunderland.com](http://www.miniatur-wunderland.com)
- 3 *Museum für Kunst und Gewerbe*  
Hamburg's Museum of Arts and Crafts has a spectacular array of installations, collections and exhibitions. With themes ranging

from East Asian artifacts to exhibition posters, and an enamoured look at the life of Coco Chanel, it would be easy to lose a day in this museum [www.mkg-hamburg.de](http://www.mkg-hamburg.de)

- 4 *Hamburger Frühlingsdom*  
The spring edition of Europe's oldest and largest carnival runs until 21<sup>st</sup> April this year, and even if only for a brief spell, it is an experience to relish. Attracting over 11 million people in 2013, the combination of fairground rides and fireworks is a great way to relive those childhood memories [www.hamburger-dom.de](http://www.hamburger-dom.de)
- 5 *Uebel und Gefährlich*  
Not content with an evening meal and an early night? Hamburg's nightlife offers the perfect remedy for that, with a multitude of nightclubs scattered across the city. Uebel und Gefährlich is perhaps the most interesting of them all, housed within a World War II bunker [www.uebelundgefaherlich.com](http://www.uebelundgefaherlich.com)

## DRINK

- 1 *Le Lion*  
Though a relatively new addition to Hamburg's nightlife, Le Lion is already referred to as "One of the best bars in town." Staff with an encyclopaedic knowledge of cocktails and a relaxed atmosphere only add to Le Lion's appeal [www.lelion.net](http://www.lelion.net)
- 2 *Bar Fusion*  
The brainchild of interior designer Matteo Thun and artist Robert Wilson, Bar Fusion is unsurprisingly elegant in its design. Part of The Side hotel, the bar is quickly drawing fans for its design and excellent drinks menu [www.side-hamburg.de](http://www.side-hamburg.de)
- 3 *Ciu' Die Bar*  
A waterfront location and an extensive drinks menu are just two reasons why Ciu'Die Bar is a favourite with locals. The cosy yet comfortable interior offers a unique ambience, described as "unswervingly upmarket" [www.ciudiebar.de](http://www.ciudiebar.de)
- 4 *Bar SáVanh*  
Bar SáVanh's waterfront location and drinks menu, inspired by flavours from Laos, Cambodia, and Vietnam, tell only half the tale. Stunning surroundings, a large sun terrace and an accompanying restaurant make this a spot well worth visiting [www.indochine.de](http://www.indochine.de)
- 5 *East*  
The St. Pauli located bar/hotel/restaurant combination remains a favourite with Expo visitors. With a choice of four stylish bars and lounges, each with its own unique theme, it's not hard to see why [www.east-hamburg.com](http://www.east-hamburg.com)

Gastwerk Hotel



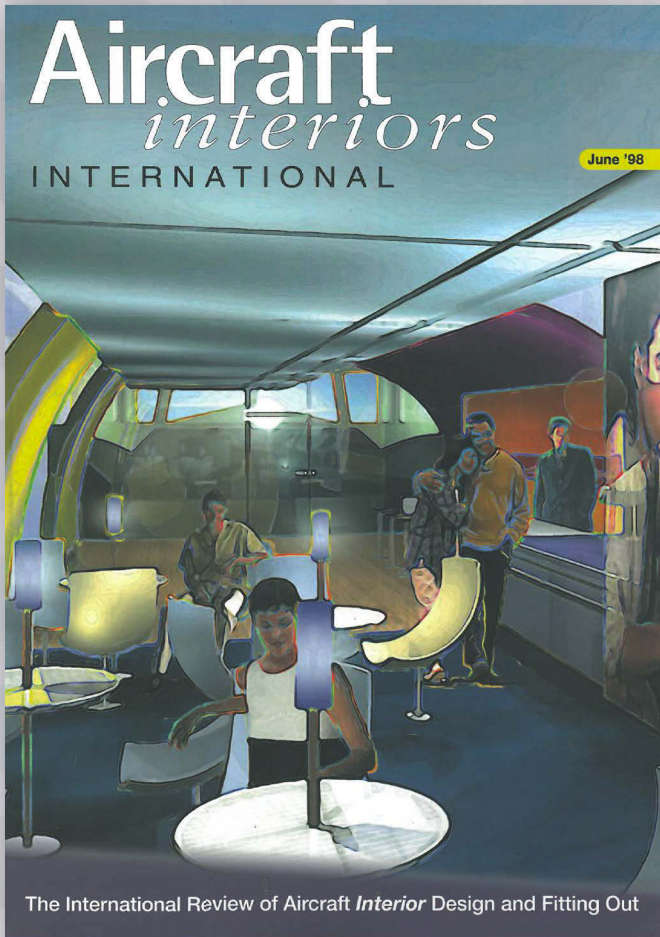
Restaurant Haerlin



Miniatur Wunderland



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# PRODUCTS SERVICES

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# everything wireless

WITH THE WIRELESS "EVERYTHING" SYSTEM, PASSENGERS CAN GO BACK TO BASICS IN ORDER TO MULTITASK

Passengers want everything – audio, movies, screen in screen, their own connected PEDs – and all at the same time. On night flights, people ‘glow in the dark’, continuously multitasking. So where is all this going?

With its new system, the aptly named Wireless “Everything”, Inflight Canada aims to go full circle back to having nothing in the seats except a safety card and sick bag. This strategy goes as far as removing the controls for the reading lights and the crew call buttons, removing all the controls that passengers take for granted to make way for the new Wireless “Everything” systems.

Years ago, Boeing equipped the 747, 767 and 777 with standard PES/PSS +P systems, providing audio and reading/call light controls at each and every seat. Overhead video could be added if the customer airline requested it – and most did.

As time went by, the PCU with its PES/PSS +P features and the overhead video system were replaced by in-seat AVOD systems with their own PSS +P features. This evolution quietly killed the lowly PCU and its associated SEB.

Although the B747 and B777 have a much more colourful history of PES/PSS +P systems, for this discussion let’s stick to the B767’s story as an example of a wide-body aircraft – not just a Boeing wide-body.

Back then, Matsushita provided the B767 PES/PSS +P system with audio channel/volume selection, and a reading/call light control at each seat via a PCU.

This system was on most B767s until the last -300s and the -400s, when a Hughes PSS-only system, without PCUs or SEBs, was introduced because it only operated with in-seat systems, making PCUs and SEBs redundant.



The PES/PSS +P system will incorporate innovative audio reproduction using the most recent technology

All B767s equipped with PES/PSS +P and overhead video systems worked well until the retrofits of these aircraft with in-seat video systems raised integration issues.

Retrofits required certain in-seat systems to also include the replacement of the original PES/PSS +P system, requiring the PSU panel above each seat assembly to be modified, plus certain components and wiring within the airframe itself.

The modifications resulted in many B767 aircraft becoming non-standard, which invalidated the warranty, and was further aggravated by the original PES/PSS +P system being obsolete.

With Wireless “Everything” there are no associated PSS services and it was not possible to acquire a new PES/PSS +P or an old PSS system as they no longer existed, and those that could be salvaged had obsolete parts.

This may appear to be a bad situation, but actually it gives Inflight Canada the opportunity to improve

upon PES/PSS +P systems. The newly designed system will incorporate innovative audio reproduction using the most recent technology, resulting in crystal clear and high-fidelity stereo sound combined with USB power at each PCU.

The USB power in the new system will enable passengers to stay connected with Wireless “Everything”, continue fiddling with their connected PEDs, listen to great sound and possibly watch an overhead movie, all at the same time, once again multitasking.

Are we going full circle to non-equipped seats where passengers can have a reading light to enjoy a book, sip a drink and listen to great sound? In the near future, passengers will be able to multitask in their own way. ☒

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# colourmatters

COLOUR AND TEXTURE CREATE AN INDIVIDUAL EXPERIENCE, SAYS DAVID SCOTT, GLOBAL CREATIVE AT KYDEX

Choosing a colour on which to build a design direction for an aircraft interior is no small task. Because it is such a personal and powerful element, colour requires thoughtful consideration. Colour evokes mood, feeling, and even weight. It can influence spatial perception by enhancing geometric plane and direction. It can be calming, or highlight a feature of a finished design. Colour establishes a sense of place and means different things to different cultures. These ideas about the power of colour are not new; they are understood by us all at some level. What is new, and perhaps novel, is the way colour is being thought about, used, and how it is fortifying the movement of the customised passenger experience.

I want my own personal experience. Just like everyone else. Today's aviation brands understand that passenger experience matters, and they are dedicating more resources towards attracting and retaining customers through the enhanced experience of their brands. For years, designers of aviation interiors have been utilising colour, special effects and branding in design to elevate the passenger experience. Today's discerning passengers are accustomed to a personalised environment, one designed and built just for them. It is the age of mass-produced customisation. We are all encouraged and seeking to tell our personal stories through our choices. We want that personalisation reflected back to us: in our choice of consumer goods, clothing, footwear, while shopping, and yes, on a commercial flight.

It is important to understand the tastes and expectations of today's consumers, as no one wants to create an assaulting rainbow of colour in the quest to please the masses. Quite the



It is the age of mass-produced customisation. We are all encouraged and seeking to tell our personal stories

contrary. What we are seeing and expecting for the future is the technique of using the same colour, repeated in different ways throughout the cabin. In today's designs, we are seeing implementation of shades on different objects with strategic and subtle layering of textures and effects that further expand the colour's range. For example, silver can appear as shades of brown to grey, to silver-like, perhaps never actually experienced as something clearly silver. A singular hue with a rainbow of experiences is a powerful tool in providing consistent design throughout a cabin, while still inviting personal experience of that specific time and space.

In the overall passenger experience, the feel of materials is as important as their appearance. Different types of texture will give the same colour shade a different appearance. Furthermore, texture can be visible and invisible. In the case where it isn't evident by sight,

it becomes all about touch. Combined, colour and texture can effectively work to create a personal experience for passengers: individualised for where they are both physically and mentally while literally on a journey.

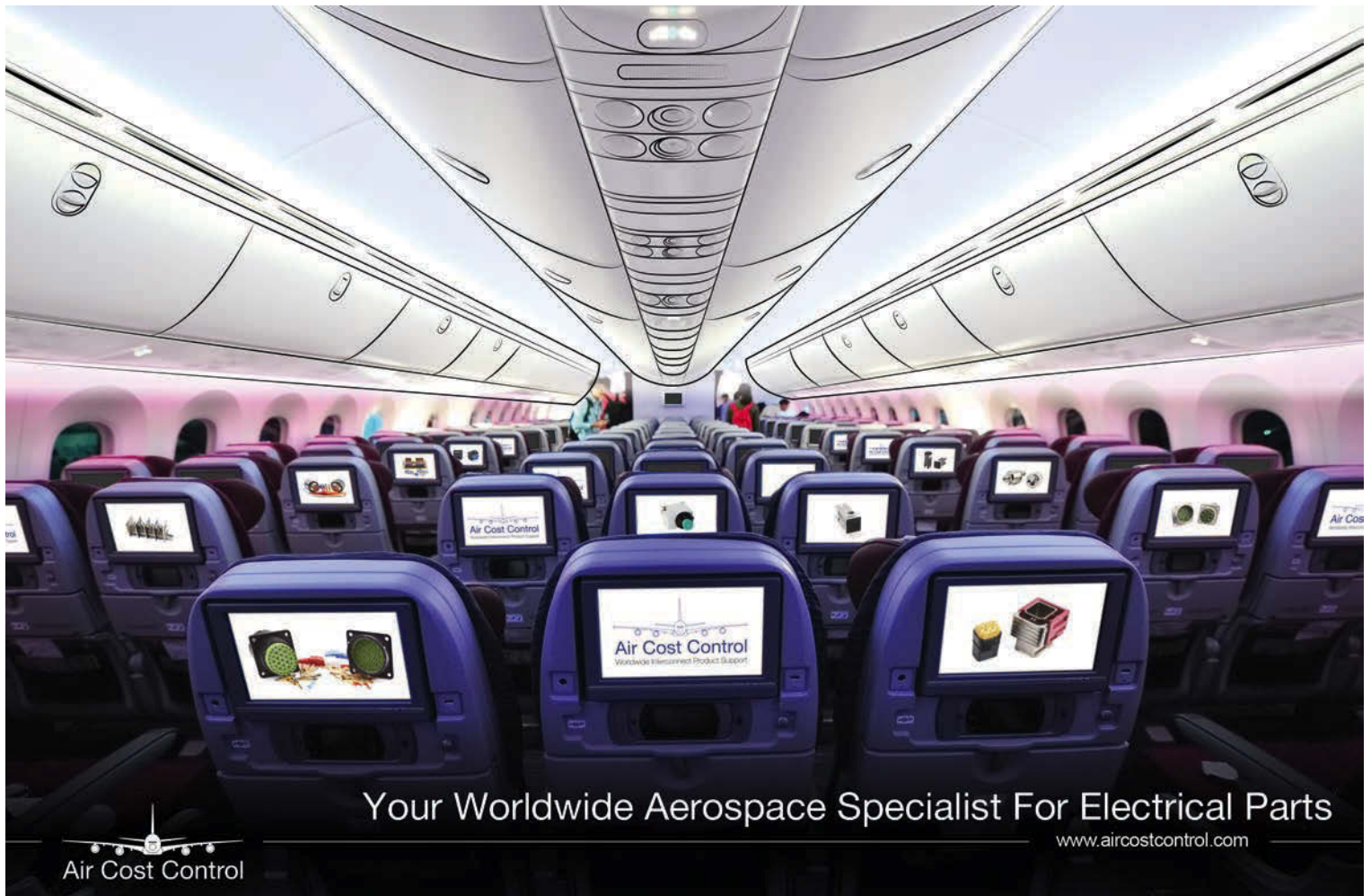
In aviation, trend doesn't mean what is popular at the moment, or even what might be popular a few years from now. Trend is a prevailing tendency or specific direction resulting from myriad influencing factors and intentions. Changes are thoughtfully conceived and carefully planned for years in advance. The technique of layering shades of colour with texture and effect is an exacting, yet natural progression in the industry. It all connects for some extraordinary possibilities for personalised passenger experience. ☒

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# Divinycell F



# hottopic

A COOL NEW TYPE OF MAGNESIUM ALLOY IS ABOUT TO BECOME A BIG INFLUENCE IN AIRCRAFT INTERIORS



Some of the best innovations in aviation occur quietly in the background, while everyone else is following the flashy stuff. Those involved in aircraft interiors are drawn to the beautiful designs of new aircraft seat structures, with a focus on the aesthetic elements and comfort features. The structural elements of the seat, hidden under layers of plush cushions and tailored covers, lack the flash, but they have abundant substance.

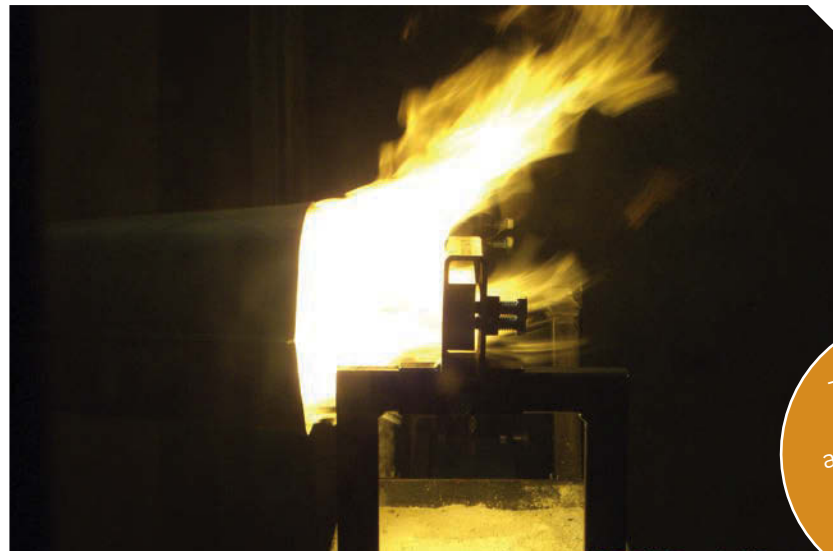
Recently, one structural development has captured the interest of both industry insiders and industry observers. As it turns out, magnesium is a hot topic. Very hot. In fact, heat (or lack thereof) is at the heart of a revolutionary development by Magnesium Elektron.

For decades, magnesium has been banned from aircraft interiors because of the perceived threat of intense fire, producing high heat and bright light. As a result, there aren't even any magnesium flammability certification tests contained in FAR 25.853.

Because magnesium alloys have the potential to reduce the weight of seats by 30% – an important factor for consideration by seat manufacturers and airlines alike – this ban has been a great deterrent to progress in the design of new lighter-weight structures.

Additionally, magnesium alloys have advantages for dynamic testing because of their excellent low density, stiffness and ductility, to withstand the rigours of 16G sled testing. This gives them beneficial strength and flexibility, ensuring good performance when pitch and roll is applied.

Without first overcoming flammability concerns, however, none of these other properties mattered. Guided by the express ban in SAE Standard AS-8049



The FAA will soon release a report that will pave the way for magnesium to be used in cabins

(the standard banning magnesium), the industry wrote magnesium off as too risky.

When Bruce Gwynne, vice president of divisional strategic development at Magnesium Elektron, was asked to pursue the matter in 2006, he knew it was a tall order. Magnesium alloys are used in a number of aircraft systems, including structural engine components and gearboxes, but overcoming the specific ban for interiors was another matter entirely. He pursued this challenge with determination, patience and the right partners.

Tim Marker, of the FAA's William J Hughes Technical Center, agreed to work with Gwynne and take on the many iterations of testing required to approve these new magnesium alloys. Initial tests consisted of comparing the performance of full-scale seat models made of the 'legacy' magnesium, against seat models made of Magnesium Elektron's new alloys. After the new alloys (including Elektron 43) passed these burn tests, the new magnesium alloy structures were substantiated, including critical extra

time before incapacitation on the 'survivability model', the material was ready to reach the next phase.

Knowing that the magnesium alloy structure models met the flammability requirements was insufficient. Because the material was banned, there was no established test to approve alloys for production. The necessary oil burner lab-scale testing protocols had to be designed and validated. That process alone took two years and 500 tests.

All this hard work has paid off. The FAA will soon be releasing a report required to get new magnesium in the cabin under special conditions approvals. A change to TSO C127a, which references SAE AS-8049, will take time; but a change to the TSO is not required to move forward. With the report from the FAA, the industry is finally poised to reap the benefits of the hard work quietly carried out behind the scenes all these years. ☒

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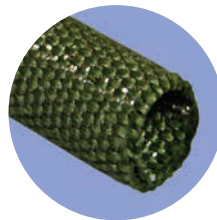
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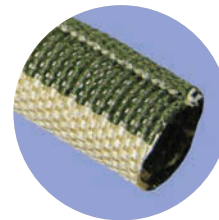
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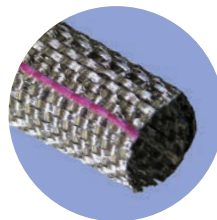
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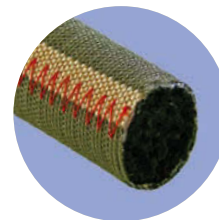
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# powerplay

**PED POWER IS NO LONGER THE PRESERVE OF PREMIUM LONG-HAUL PASSENGERS, AND IS BEING INCREASINGLY DEMANDED ON NARROW-BODY AIRCRAFT**

 In October 2013, the FAA and other regulatory authorities around the world approved the Consumer Electronics Association committee's recommendation to allow PEDs to be fully operational gate-to-gate.

The new rules are also having a positive impact on the adoption rate of in-seat power, such as the Empower in-seat power system from Astronics, for narrow-body aircraft. Prior to this ruling, PED power suppliers' main market was wide-body and long-haul fleets. Now, the narrow-body fleets have become a target-rich environment for PED power. Why? The normal three-to four-hour flight just became a four-to five-hour PED journey. It is a new era of PED acceptance and revenue generation for airlines. Even airlines flying shorter routes will see their customers expect PED power.

A SITA survey revealed that 76% of passengers carry smartphones on board; most people use them, draining their batteries. In addition, a survey concluded that 65% of passengers carry multiple devices on board (e.g. a laptop and smartphone).

Combine the insatiable need of passengers to use their PEDs with the FAA rule change, and one has a perfect storm for PED power. Employees must stay powered to meet their business needs. Passengers are bringing their own entertainment on board with them. And the millennial generation must be in touch with their device at all times. Another study rated PED power as the second-most requested airline amenity – behind a more comfortable seat. These factors are all influencing airlines' decisions to rapidly install PED power on all flights and in all seats.

Obviously, when a PED is on and being used, it drains the internal



battery. What is not commonly known is that enabling the PED's wi-fi drains the battery 30% faster. So a three-hour battery quickly becomes a two-hour battery, and this assumes that passengers boarded the aircraft with a full charge. Wi-fi and air-to-ground connectivity are currently being installed on over 3,000 aircraft. Regardless of whether your PED is connected to a cached media server on board, to the ground via cellular service, or to the World Wide Web via satellite communication – passenger demand for connectivity is skyrocketing. Now that passengers are able to use their device from gate-to-gate, they want to be connected – and airlines are responding to both demands by installing connectivity and PED power. So, you are no longer limited to the content you pre-loaded on your device, nor are you limited to working old emails in your inbox. A simple wireless connection to the aircraft wi-fi system, and you are back in the office, at school, gaming with friends, or using the latest instant

One study rated PED power as the second-most requested airline amenity – behind a more comfortable seat



messaging and social media application. Most of the connectivity services are fee-based, so competitive airlines must provide PED power to meet paying passengers' expectations. The last thing they want is a dead battery after paying for the service.

Many airlines continue to install IFE in every seat as a passenger convenience and market discriminator, but some airlines are adopting the BYOD (bring your own device) model. In this model, the airline provides passengers with highly reliable PED power and the passengers determine the device they choose to use. By installing PED power, the airline has a competitive advantage and satisfies its passengers' desires. Other innovative solutions, such as a docking tray, PED 'hanger' and 'take out' content, support this model.

Some airlines around the world foresaw the regulatory agency rule change and have even started installation of in-seat power on their narrow-body fleet. This has created a brand differentiator, which several other operators are likely to follow. ☒

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# balancingact

IT IS DIFFICULT TO FIND A BALANCE BETWEEN COST SAVINGS AND PASSENGER SATISFACTION, BUT A NEW PRODUCT HAS BEEN DESIGNED TO DO JUST THAT

In today's competitive skies, airlines face the challenge of improving operating yield while satisfying frequent flying passengers with comfort and service levels that build loyalty. Passengers are savvy, bolstered by an ability to share, assess and critique in an age of instant communication and social networking, which further complicates airlines' decisions on cabin configuration and refurbishment. Is there a way for airlines to reconfigure economy cabins so that the conflicting extremes of cost efficiency and enhanced service can both be achieved? Timco Aerosystems, the aircraft interiors division of Timco Aviation Services and a part of HAECO, believes it offers a solution through its new Cabin Optimization product.

Priorities for cabin layout have changed over time, often in response to socio-economic events. In the age before deregulation, passenger comfort and attentive service were untouchable standards. In the years following 9/11, service and comfort became secondary considerations, if at all. Driven by industry-wide losses and high fuel costs, airlines turned to a relentless pursuit of cost reduction. Anything not flight and safety-critical became a candidate for removal from the cabin to reduce weight and improve economy.

More recently, airlines have discovered they can improve operational fiscal health significantly by charging ancillary fees for elements of the flight experience that had previously been complimentary, such as food and beverages and IFE. At the same time, some passengers have been quick to lament the loss of all that had been gratis, as well as other elements deemed to be deteriorations in the flight experience.

Is there a way for airlines to continue to drive improved flight economics



Cabin geometry is carefully assessed for space that is not used effectively to deliver the airline's goals

without alienating passengers in the process – especially prized frequent fliers?

Through Cabin Optimization, Timco believes it has developed a path forward. Rather than simply fitting more seats on already cramped narrow-bodies for added revenue, or removing a lavatory or galley ovens to save weight, Timco engineers first take a step back to assess an airline's overall operational goals. How important is passenger loyalty? Is there an additional revenue threshold per flight being sought? What types of food and beverage service does the airline seek to deliver?

Cabin Optimization means just what its name suggests: finding an optimum balance between maximum passenger comfort and service, and the benefits of lower operating costs and new revenue-generating opportunities. The cabin geometry is carefully assessed for space that is not used effectively to deliver the airline's goals. Enough ovens are maintained in the design to accommodate a pre-ordered economy hot meal service. Lavatories may be moved, but are configured to allow maximum space around them for other cabin modules, including new seat places.

And Cabin Optimization delivers results. On one A320 programme, Timco's engineers provided a customer with several options supporting two to six new seat places, while leaving unchanged a dual lavatory service in the aft cabin, supporting regular beverage and snack service stowage for multiple segments, and driving only a minor change in seat pitch. Payback was calculated at less than six months through new seat revenue alone, before consideration for weight benefits and maintenance savings.

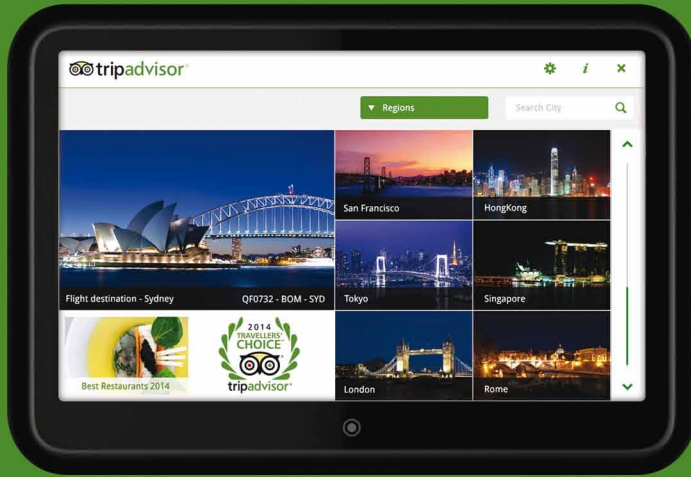
While the days of white linen and overstuffed cabin seating at a generous pitch are likely to remain memories for most coach cabins, there appears hope for the beleaguered economy passengers and the airlines that want to retain their loyalty. Cabin Optimization could very well provide those operators with the means for offering an experience that might be looked back upon fondly in aviation memories of the future. ☒

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# interiorsmarketplace

WITH THE INTRODUCTION OF A NEW INTERNET-BASED MARKETPLACE, BUYING AIRCRAFT INTERIOR PRODUCTS IS ABOUT TO BECOME A LOT EASIER

While other parts of the aviation industry have been digitalised in many ways, there has so far not been a sophisticated online platform where traders could search for, buy and sell aircraft interiors. Buyers looking for products and related services have had to contact sources around the globe in various time zones. Sellers are constantly looking for new opportunities to promote their products worldwide. Since owners do not have the marketing tools required to promote their products internationally, a substantial proportion of the stock on the market remains invisible.

To cope with our growing industry, sellers and buyers need an efficient platform. Based on well-established growth rates, the number of aircraft will double in the next 15 years, with a resultant high demand for surplus interiors. More airlines will be looking for reasonably priced aircraft interiors with short lead times, for example by using refurbished stock from a range of sellers. In an increasingly challenging environment, more efficiency is definitely what most sellers and buyers are looking for.

Introducing [aviationgate.com](http://aviationgate.com): the right idea at the right time. Company founder Thomas Bulirsch (pictured left in photo) says that it is no exaggeration that [aviationgate.com](http://aviationgate.com) will revolutionise the way you search for, buy and sell aircraft interiors. "Our clients will save valuable time and money," he says. "With sophisticated database technology, it is easier than ever to search internationally for the exact products you need or to offer interiors stock for sale."

Company co-founder Dimitrios Tsirangelos (pictured right) adds, "Sellers from all around the world can upload their stock by following a simple



step-by-step process on the website. Product details can be uploaded from anywhere at any time – all you need is an internet connection. Offers and RFQs can be managed via a user-friendly dashboard, and their status can be checked at a glance."

Buyers benefit by searching for the exact products they need. They can simply choose their desired product category and add the aircraft type, model, condition or any other requirement they might have. Different categories, such as seats and galleys, allow for quick navigation. And this can be done 24 hours a day, all around the world, with no monthly fees.

It is easier than ever to search internationally for the exact products required

By comparing offers it is easier than ever to see what's on the market and to receive interior solutions that fit the requirements. Buyers can also post special requests to a digital noticeboard. Registration is free of charge and there is no commission for buyers. The commission for sellers is triggered only when the product is sold via [aviationgate.com](http://aviationgate.com).

To guarantee quality listings, the experienced Aviationgate team checks every submitted offer carefully within one working day. The offer is only released and announced to worldwide buyers after it has been confirmed. The Aviationgate team consists of specialists in aircraft interiors, IFE systems and connectivity who have worked in this field for over 15 years and have built a successful team over several years.

The Aviationgate team is already planning to add more services, including consulting, financial, refurbishment and certification. Products and services will be frequently promoted in specifically created campaigns or via direct mailings sent to numerous premium contacts.

Register online at [aviationgate.com](http://aviationgate.com) or meet the [aviationgate.com](http://aviationgate.com) team in person at Aircraft Interiors Expo 2014 in hall 5, booth 5A50. ☒

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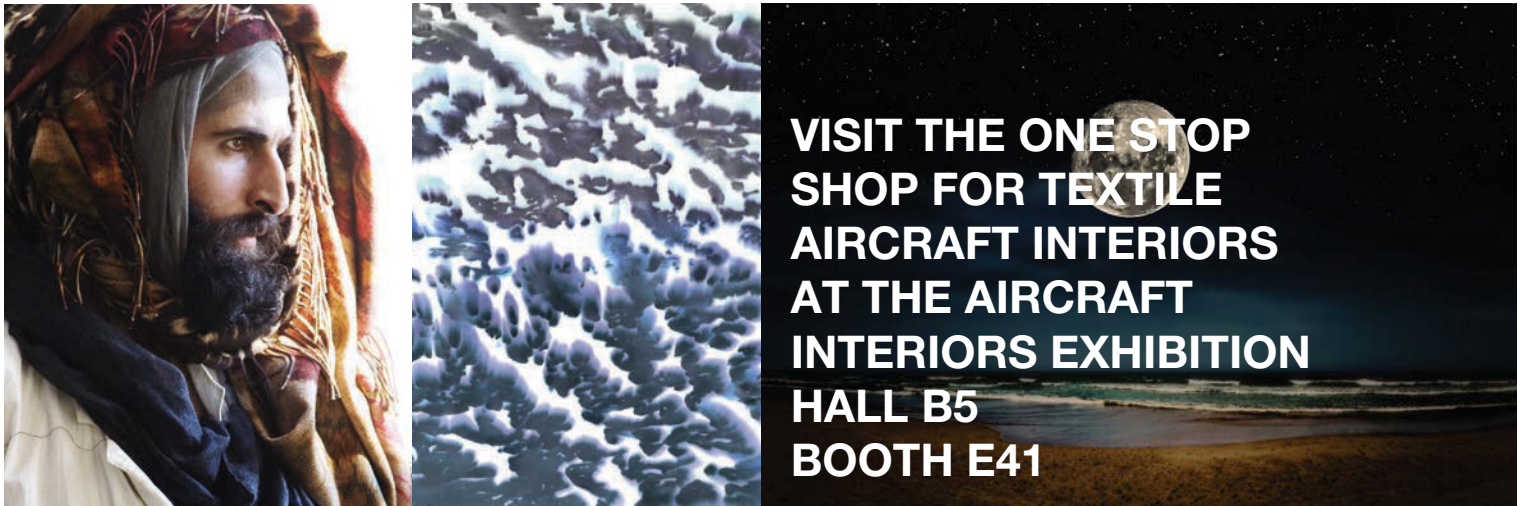
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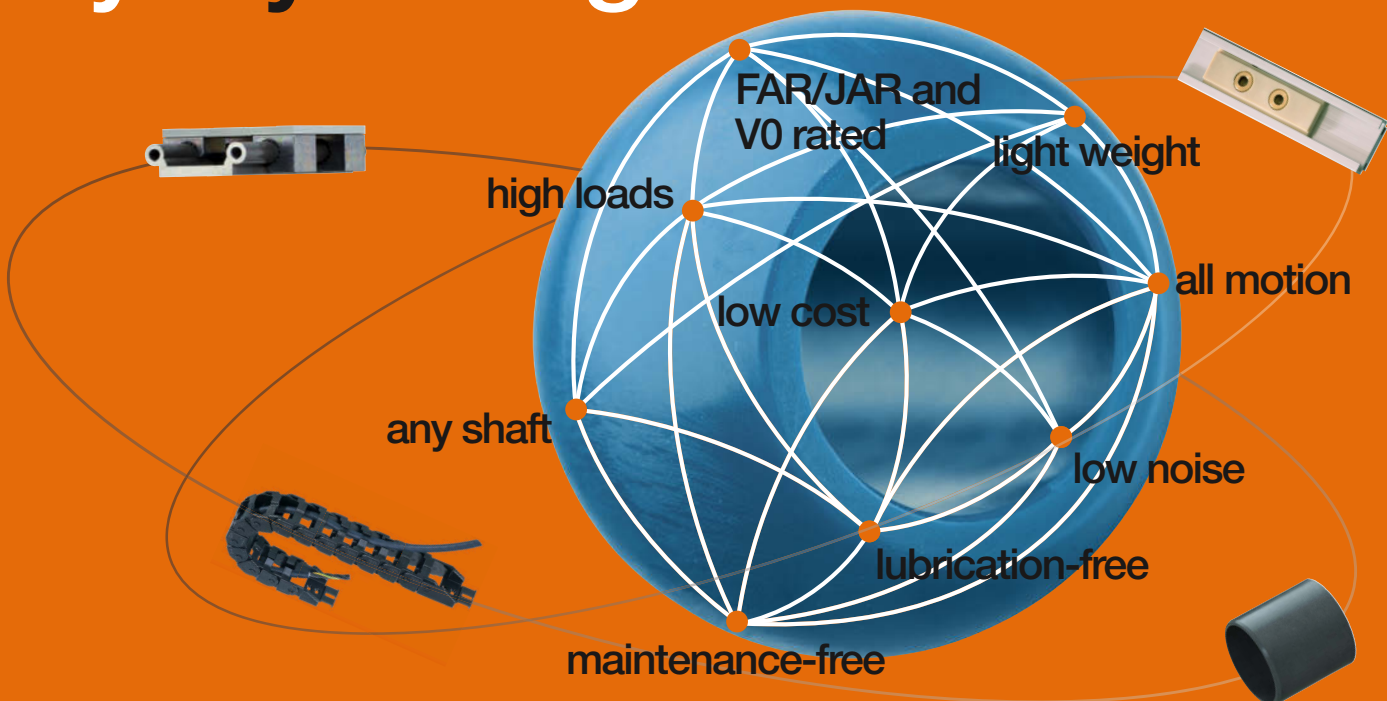
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# innovationworkshop

INVESTMENTS INTO ITS RESEARCH AND DEVELOPMENT FACILITIES MEAN BOXMARK CAN DELIVER PRECISE AND LIGHTWEIGHT LEATHER PRODUCTS IN SHORT TIMESCALES

At Boxmark in Slovenia, visions converge with innovations and merge to form customised product solutions. The R&D centre develops trend-setting leathers, in addition to offering corresponding serial production. "It is our passion to bring out the best qualities and characteristics within each piece of leather and to convert them into extraordinary quality," says Marjan Trobiš, managing director of Boxmark Slovenia. From leather hides to leather-covered components, be it a prototype, a serial product or a customised workpiece – each creation is a symbiosis of masterful craftsmanship and industrial manufacturing technology.

As an international supplier of complete solutions, Boxmark's R&D centre has, for decades, been playing a crucial role in the automotive industry in terms of developing and producing automotive interiors. Concrete results, and the considerable investments made, illustrate the particular importance that R&D is awarded at the company. Due to increased demand from the airline, shipping, railway and furniture industries, it became necessary to expand the Slovenian facility.

Apart from the expansion of the production areas and a modernisation of the machinery, numerous new technical installations were acquired. These include 3D scanners and state-of-the-art computing systems, which allow a virtual development of prototypes; as well as CNC-controlled machines, band saws and milling machines. Boxmark is also able to create foam models, perform foam reconstructions and add upholstery to existing seat systems and add-on components. "Each and every customer requirement is unique and brings along



In combination with the Xtreme characteristics, this material is easy to clean and extremely durable

its own challenges for which we need to find timely and customised solutions. With our manufacturing facilities and machines, which were custom-made for us, we can fulfil even unusual requirements reliably and on schedule. Together with scientific institutes, we are always working on new machines and processing technologies, in order to continue being one of the best," explains Alexander Mesaric, head of the engineering centre.

Due to the successful implementation of projects in other sectors of the leather industry, Boxmark was able to win over airline customers for the implementation of development and serial production projects. Currently, the company is developing and mass-producing interior



components for several makers and owners of aircraft. In the airline industry, weight is of crucial importance. This is why in this area the company uses its self-developed lightweight Xlight leather, which weighs a mere 600gsm (already laminated). This low weight is achieved through changes to the formulation used in the tannery, which leave the chemical and physical characteristics, as well as the customary strength of the leather, unchanged. This material reduces the overall weight of any aircraft. In combination with the Xtreme characteristics, this material is easy to clean and extremely durable.

With the Production Organisation Approval certificate, which was granted in 2013, Boxmark is now authorised as a certified producer for aeronautics and thus a supplier to the international aircraft industry. ☒

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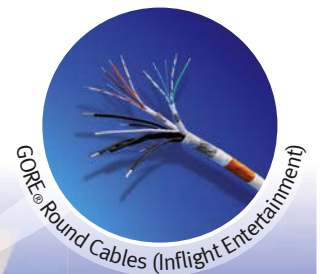
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# flameretardanttanning

INTRODUCING A SYSTEM THAT CAN ENABLE TANNERS TO CREATE NEW TYPES OF CHROME-FREE, DURABLE AND FLAME-RETARDANT LEATHERS

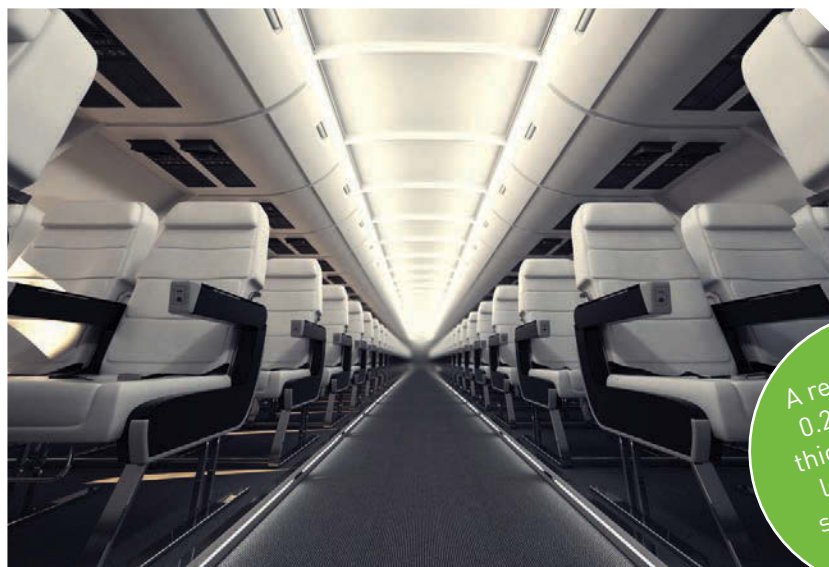


Clariant, a leading global chemicals company, has developed a new method of producing flame-retardant upholstery leather for the aviation industry. Currently, leather used in aircraft interiors, which is mainly based on chrome-tanned leather, has to be treated with flame-retardant products to fulfil specific demands. The addition and application of these products can cause problems and expense for the tanner, as well as inconsistencies in the final product.

Clariant has now made it possible for tanners to manufacture a new, strong type of chrome-free leather with its EasyWhite Tan system, based on its patented Granofin Easy F-90 Liquid, which incorporates flame-resistant properties as an integral part of its chemistry. The EasyWhite Tan process is considered by its makers to be the first fundamental change in the tanning industry for more than a century.

To understand the importance of this new product, one has to compare it with traditional systems. Producing fire-retardant leather usually involves a complex method that has to be carefully controlled throughout the tanning and finishing process; the application of specific flame retardants is unavoidable and it uses retardant agents that are not chemically fixed to the leather. As it is physically deposited onto the surface of the leather, it makes an even distribution more difficult, which can lead to problems of area yield, milling properties, over-elasticity and substance control.

Typically, flame-retardant agents are physically stored between the leather fibres, limiting the fixation and mechanical operations, which can lead to a squeezing of the flame-retardant agent out of the leather. However, Clariant's Granofin Easy F-90 Liquid



A reduction of 0.2mm in the thickness of the leather could save 150gsm of final leather

is chemically bound to the fibres within the structure of the hide during the tanning process, stays in the leather, and is not squeezed or washed out. It promotes very even and consistent flammability resistance throughout the cross-section of the hide.

The main challenges that aircraft leathers present to the tanner are: the vertical flammability test, involving burning for 12-60 seconds; self-extinguishment within a defined period of time; toxicity test and volumes of such toxins emitted during combustion (acute toxicity); smoke density; heat release during combustion; specific weight; physical strengths at a relatively low thickness; and the application of flame-retardant agents.

The fact that EasyWhite Tan based on Clariant's Granofin Easy F-90 Liquid is naturally flame retardant, with definite self-extinguishment properties, simplified the work then required in finding a synergistic retanning and softening combination to create the correct qualities and attributes of the leather, not only from the technical and

aesthetic points of view, but also from the point of view of commercial viability.

EasyWhite Tan leather is claimed to exhibit stronger physical strength than many leathers. Of particular importance for seat construction is the additional tear and stitch-tear strength that the process generates. This enables the production of a thinner, lighter leather, which has a direct effect on the all-important weight reduction looked for by the aviation sector. A reduction of 0.2mm in the thickness of the leather could save 150gsm of final leather.

The EasyWhite Tan system has further advantages for the tanner as it removes a number of stages in the tanning process, including pickling, basification, or the addition of other fixation products as would normally be required when tanning with metal salts or organic products. ☒

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# ultralight

IS THERE ANYTHING BETTER THAN TRADITIONAL LEATHER? TAPIS BELIEVES SO: ITS ULTRALEATHER PRODUCT

 Aircraft seating requires an extremely durable, yet soft and comfortable, fabric. And while traditional leather has long been a popular choice for seating, the Tapis Ultraleather brand of products offers a more luxurious feel, look and style, with enhanced performance features.

For more than a decade, Ultraleather has been successfully used in high-wear seating applications on Embraer aircraft worldwide for the Express Jet fleet and many others.

Since 1966, Ultraleather had been produced using high-quality polycarbonate resins in the manufacturing process. Each product undergoes rigorous hydrolysis testing (per test methods ISO 1419 Method C and ASTM D 3690-02 se. 6.11), ensuring that every offering on the market meets premium standards for durability, as well as heat/moisture and UV resistance. Lesser quality leather alternatives and resin composites, such as polyether and polyester, have a much shorter lifespan than Ultraleather.

Ultraleather also weighs less than half the weight of traditional leathers, and as a result, it helps reduce fuel consumption, driving costs down and reducing the overall weight of the seat and cabin. There is also less shrinkage than with traditional leathers, offering 100% yield. This translates into minimal low waste with 100% usable fabric. In addition, unlike traditional leathers, Ultraleather maintains a consistent colour and texture throughout the entire production run.

The company's custom-matching capabilities offer a unique opportunity to create an original cabin design, while assisting clients in fulfilling their design vision. Tapis has developed custom grains and unique colours/finishes with Ultraleather products for leading



airlines around the world, including Singapore Airlines, Etihad Airways, Swiss International Air Lines, Kingfisher Airlines and JAL. On each occasion, Tapis created a customised programme to meet both the designer's and the airline's precise needs for texture and colour. The Promessa fabric has many different grains that can be customised for an airline's seating programme.

Many fabrics in the Tapis product line complement each other, allowing for even more customisation and balance in the cabin. Ultrasuede and TapiSuede flannels are also great seat materials, and have been used in combination with

Ultraleather as seat inserts.

TapiSuede BHC-SS maintains the same characteristics as the standard TapiSuede, but is extremely light in weight and meets the most stringent flame-retardant requirements for commercial aircraft. In fact, TapiSuede BHC-SS can be found on the new JAL First Class 777 programme and the new Lufthansa A380 and 747-800.

Ultrasuede is made from 100% recycled ultra-microfibres, and the innovative technology used in its production results in reduced energy consumption and a more ecologically sound manufacturing process. Emirates, Virgin Atlantic, British Airways, LOT Polish Airlines and El Al Airlines are just a few of the airlines currently using Ultrasuede for seating and other applications.

Tapis now offers laser etching on its Ultrasuede fabric. A custom laser-etching process adds a pattern to the fabric using a laser without a screen or roller for printing. This innovative laser system has been designed to transform Ultrasuede to fulfil your design vision, and this technology guarantees extraordinary decorating results without compromising the quality and durability of the product.

The laser system has been designed to transform every type of fabric from roll to roll in continuous mode. This unique process can duplicate a pattern from a photo, thus offering exclusive decorating effects. There is no environmental impact – no water or chemical products are necessary for running the system and no waste is produced that requires disposal with special processing. ☒

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# new beginnings

IT'S AN EXCITING START TO 2014 FOR KID-SYSTEME, WITH NEW TECHNOLOGIES AND NEW BRANDING

 The past 12 months have been an exciting and important time for KID-Systeme. Not only has the company maintained its position as one of the world's most trusted suppliers of inflight power supplies, it has also expanded its product range with the launch of SKYfi, an entirely new way for airlines to provide wirelessly streamed internet content to passengers. And, all the while, the company has continued to invest in its global service network to deliver support where customers need it.

To better reflect these developments, it was the right time to refresh the public face of KID-Systeme and underline the company's innovative spirit and cutting-edge technology.

The new logo reflects the company's operational independence and ambition, through which KID has amassed great expertise in supporting aircraft from all the world's major manufacturers. The new website showcases this new corporate identity and makes it easier for customers and suppliers to browse products and services and find the information or support they need.

For example, the compelling advantages of SKYfi are fully detailed on KID's new webpage. Mobile device subscriptions are growing rapidly and by 2015 are expected to outnumber the world's population. Passengers expect instant access to their personal electronic devices wherever they may be.

SKYfi enables passengers to access the internet, GSM telephony and wireless content through their own personal electronic devices while in flight, providing airlines with a major revenue opportunity and enhancing the passenger experience.

SKYfi may also be combined with KID's in-seat power supply family:



SKYfi enables passengers to access the internet, GSM and wireless via PEDs

**SKYpower.** SKYpower and SKYfi are multifleet products and can be installed by supplemental type certificate (STC) on all major commercial aircraft.

As it enters 2014, KID-Systeme is placed more strongly than ever at the leading edge of electronic cabin systems for passenger and corporate aircraft. The company was the first to introduce the internet on board commercial aircraft in 2009, and today it continues to provide new and exciting solutions for more than 80 airlines worldwide. KID-Systems has its

headquarters in Buxtehude, Germany, together with a service centre.

There are also service centres in Beijing, Dallas, Dubai, São Paulo and Seattle, and KID greatly looks forward to continuing its close relationships with customers, providing products, technical support, training and servicing. ☒

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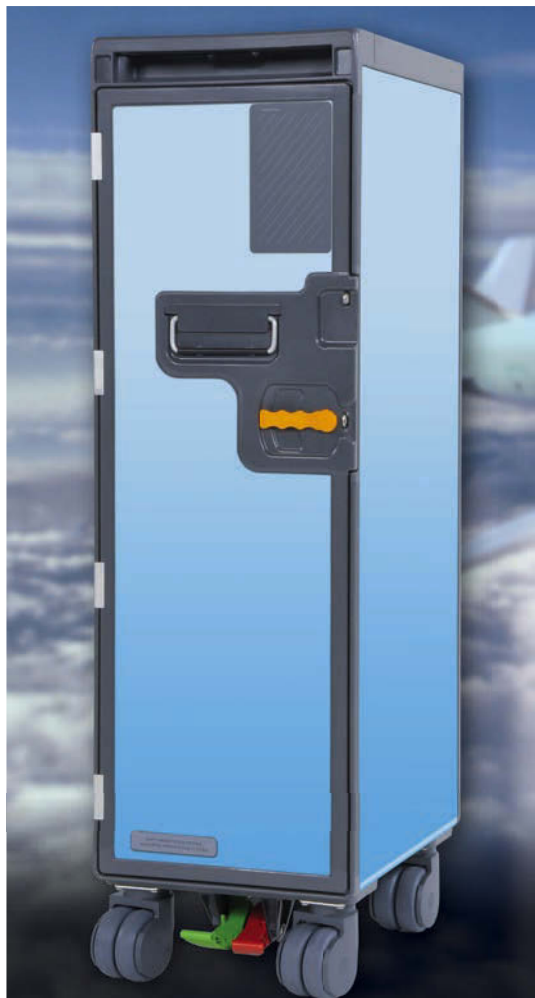
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# gotconnectivity

**DON'T UNDERESTIMATE THE ROLE OF INTERCONNECT TECHNOLOGY IN THE PASSENGER EXPERIENCE. THESE LITTLE BUNDLES OF TECHNOLOGY CAN AID CONNECTIVITY FOR CONNECTED FLYERS**

What is the first thing you do after you take your seat on a flight? Text your loved ones, get those last emails through, check your favourite team's game stats, verify the weather conditions in your connecting airport? It's the 'hurry up because we'll be disconnected until 10,000ft' rush. Yes, the time has come where you no longer have to turn off your personal entertainment device (PED). The FAA lifting the ban in the USA last December brings about the need for better, faster and higher bandwidth.

So how does Carlisle Interconnect Technologies (CarlisleIT), as an interconnect company, help airframers, airlines, IFE/avionics/Satcom OEMs and the super-connected flyer combat their connectivity needs? With little bundles of technology that provide excellent communication with systems, aesthetically pleasing control panels and engineered solutions, CarlisleIT can meet the ever-expanding industry's demands. While CarlisleIT's foundation is in wire and cable, producing lightweight, high temperature, tight radius products, the company can now offer such solutions with a multitude of interconnect products.

What are these little bundles of technology? They are the LITEflight EP loose structured fibre, which can be easily terminated without breaking while providing superior data exchanges; the Octax 10Gb/s Ethernet assemblies that supply the ability to transfer more information than ever before; the unobtrusive FlightGear Smoke Detector Control Panels that can be colour-coordinated with cabin interiors; and the Blind Mate Antenna Connector, which gives airlines a quick field-replaceable solution, as opposed to ripping out metres of cable. This just scratches



The FAA lifting the ban in the USA brings about the need for better, faster and higher bandwidth

the surface of a well-stacked deck of CarlisleIT products and services.

The challenges that will ensue with the coming age of ground-to-air and air-to-air communication congestion are issues the company is well capable of solving. CarlisleIT has in-house engineering resources that produce a great range of innovations.

CarlisleIT is also one of the world's leading designers and manufacturers of high-performance wire and cable, including fibre-optic cable; military and aerospace electrical contacts; RF/microwave connectors; speciality and filtered connectors; cable



assemblies; complex harnesses; integrated installation kits; light-weight ARINC trays; aerospace rack and shelf assemblies; certification services with DER, DAR and DMIR personnel on staff; and engineering support for applications in the commercial aerospace, defence electronics, industrial, medical, and test and measurement industries. ☒

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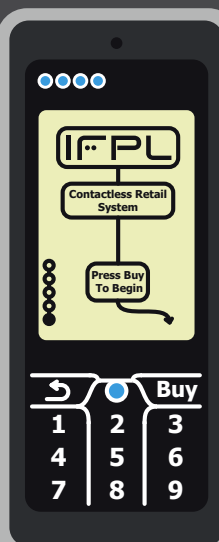
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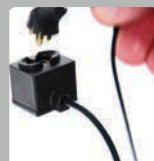
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# firstclasscooking

Aerolux has developed a comprehensive range of products to offer a full kitchen in the air



Founded in 1988 on the northwest coast of the UK, Aerolux has become well known for producing quality custom-engineered galley inserts for commercial and corporate/business aircraft.

Standards of air travel have become increasingly demanding, with customers being especially discerning about onboard experiences such as the quality of food and beverages served. For breakfast, lunch or dinner, galley equipment is essential to meeting the needs of customers. From Nespresso coffee to chilled chardonnay, from the perfect slice of toast to ice cream, the range of equipment has to be right for the job.

Starting off in the early days with a range of refrigeration products, and in particular a wine chiller, at the request of its customers Aerolux has developed specific products to enable differentiation of the cabin service, not only for the standard and premium galleys, but also from airline to airline. These products include an award-winning espresso coffee maker, a toaster, a skillet, a rice cooker, warming ovens and fridge/freezers.

Wherever possible, Aerolux has designed its galley equipment to meet industry standard configurations such as 'Atlas galley'. Key features of all Aerolux galley products include 115/200V AC, 400Hz aircraft power, safe and hygienic operation, and ease of cleaning.

The Aerolux coffee maker is a self-contained unit specifically designed for inflight preparation of espresso coffee. This is the only coffee machine approved for aircraft use to carry the Nespresso brand name, using its patented coffee capsules.

Aerolux has also designed a unit to help prepare toast or even a toasted



The Aerolux range includes a toaster, espresso maker, skillet, and rice cooker



sandwich in the galley. Just like at home, the Aerolux toaster will toast two or four slices of bread, lightly toasted or dark. The unit has been designed and built from food-grade materials. It enables easy cleaning for hygiene purposes and minimises crumbs with its removable crumb tray.

For the complete breakfast in the air, Aerolux has developed the Aero-Skillet

– a safe and easy-to-use hot plate, which is suitable for cooking eggs or hash browns.

Initially designed for the preparation of rice on Asian routes, the rice cooker unit has also been adapted for heating liquid food such as consommé. The unit has been designed and built to maintain hygiene and be easy to clean, especially in an aircraft environment.

Designed to warm bread rolls or plates, the warming oven is adaptable to suit the particular requirements of the airline. A range of ovens is also available to heat prepared food, from high-speed convection ovens to steam ovens.

To keep food chilled or liquids cold before serving, the fridge units have also been adapted to keep medical supplies cold for long-term use. To keep ice cream frozen or to stop ice from melting, Aerolux's freezer products have been designed to meet the exacting requirements of airlines the world over. ☒

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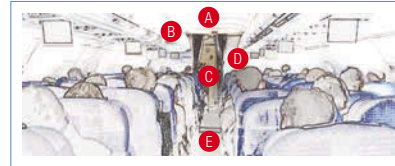
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## 1+1=3

An annual must-visit event during Aircraft Interiors Expo in Hamburg is the Trend Book presentation by Desso Custom Aviation Carpets on the Tuesday of the show. And this year there is an even better reason to visit this booth because Desso has teamed up with Aunde, a developer and manufacturer of technical textiles for aircraft cabins, to present a comprehensive one-stop-shop design and trend forecast for all cabin carpet, seating and curtain textiles.

This new co-designed collection, and the trends that it is based on, will be showcased for the very first time during Aircraft Interiors Expo in a fresh and fun way, enabling visitors to really experience the new design innovations.

"At Desso we are driven by our innovation programme, which is based on the three pillars of creativity, functionality and cradle-to-cradle design," says Nathan Jansen, aviation sales director at Desso. "The partnership with Aunde is a logical step forward to offer customers even more creativity and functionality, while at the same time ensuring that airline customers receive the highest level of quality and reassurance of tested and certified products from the two individual interior specialists."

Combining the many benefits of the partnership, this cooperation also reflects Aunde and Desso's common goal to improve customer choice, while bringing a new level of design opportunities for designers and airline brands. "This partnership is focused on really bringing design innovations to the market. It doesn't only give the customers a collection to choose from, but also enables us to jointly develop custom-made aircraft interior projects," says Peter Bolten, Aunde's director of development and sales.

The annual Trend Presentation is scheduled to commence at 4:30pm in Hall B5 Booth E41, right opposite the *Aircraft Interiors International* booth. We will be there to experience the newest trends in aircraft cabin carpets and textiles.

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## cabinnoise

Array microphones used with acoustic beamforming and holography methods help determine aircraft noise source locations. The resultant noise reduction improves sound quality and passenger comfort inside the cabin.

Assessing and minimising cabin noise is a top priority for the aerospace industry. Complex acoustic signals in the audible hearing range (20 to 20,000kHz) or beyond can vary from causing mild discomfort, to extreme cases where resonating human organs induce headaches or nausea. Commercial airliners, business jets and helicopters require cabin noise reduction – and manufacturers view it as critical to their success and competitiveness.

Measuring noise requires large arrays of strategically placed microphones combined with software for beamforming, Helmholtz Equation Least Square, or acoustic holography methods. This provides the interior acoustic engineer with improved acoustic sound pressure mapping, surface velocity, acoustic power and intensity measurements. This data is used to determine where to place sound-absorbing materials and fabrics inside the cabin.

A business jet test begins by removing all interior panels in the passenger cabin. Flight testing in the passenger cabin is conducted using conformal circular arrays consisting of 60 microphones to cover circumferential measurements around the interior fuselage and a planar microphone array of 50 microphones for cabin door surface measurements. Analysis of microphones located near passenger seats reveals acoustic pressure fields and 'hot spots' in the cabin where noise is transmitted into the cabin. In this case, door seals can be improved to reduce the noise, and improve sound quality and passenger comfort inside the cabin.

Detecting noise can be difficult when measuring sound in different locations from multiple sources. The use of array microphones and proper analysis can assist in noise source locations and passenger comfort inside the cabin.

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# titaniumtreat

On 4 March, Expliseat announced the first order for its Titanium seat, a revolutionary economy seat at 4kg/pax. French airline Air Méditerranée will be the first to fly the Titanium seat on its A321, reducing the aircraft's weight by 2 tons through the installation of the world's lightest aircraft seat. This translates into more than €233,000 (US\$320,000) of fuel savings per year for this aircraft. Meanwhile, passengers benefit from Expliseat's innovations through increased comfort and extra space (an extra 2in per row).

This commercial success is based on innovation: Expliseat has developed the best technologies for weight and robustness (titanium and composite) into the economy cabin interior. Thanks to 10 international patents, Expliseat creates added value for both airlines and customers.

While airlines get major savings in terms of fuel, CO<sub>2</sub> and maintenance costs, passengers can enjoy enhanced comfort on the A320 and B737 families. After exhibiting at Dubai AIME and at the Singapore Airshow, Expliseat will present its Titanium seat at Aircraft Interiors Expo in Hamburg, Germany, on 8-10 April.

Along with this technological breakthrough comes a robust industrial model. Expliseat has gathered major industrial companies from the automotive and aerospace business to involve the best partners in the Titanium seat's production. Production capacity can reach 170 shipsets per year, with high quality levels.

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# balancingact

Today, airlines are in a difficult situation: on the one hand they are forced by passenger requests or competition to increase the level of comfort in their cabins, while on the other hand they have to decrease their costs to stay competitive in the market. To handle this kind of balancing act in an effective way, a new generation of products is necessary.

Dornier Technologie is one of the few companies that realised this need very early. For years, it has successfully developed and launched highly reliable products. The family of concepts is easy to customise and enables endless individual designs.

One of the many examples is the Glass PCU, which won a Crystal Cabin Award in 2013 in the Premium Class & VIP category. Not only do its sophisticated appearance and robustness make it an outstanding product, its significant decrease in the total cost of ownership is attracting an increasing number of airlines and seat manufacturers.

During Aircraft Interiors Expo in Hamburg, Dornier Technologie will show many of its new developments, including a curved glass PCU, reading lights, RGB mood lighting, and a quiet and lightweight lumbar system with massage function.

Together with the German company Bühler Motors, Dornier will also present Paxcom, its new intelligent actuation system.

All this results in benefits for customers, who can get most of the components that determine the comfort of a seat from one source.

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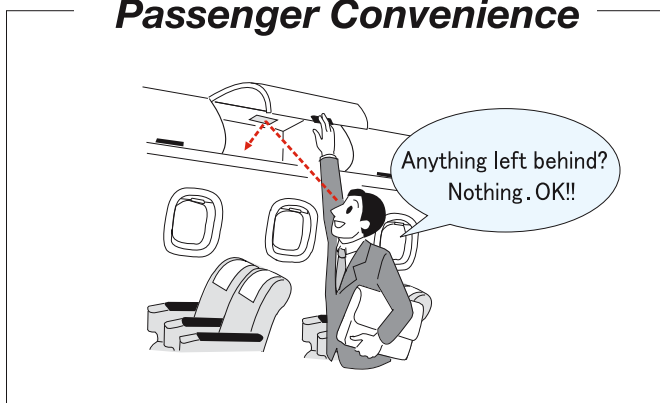
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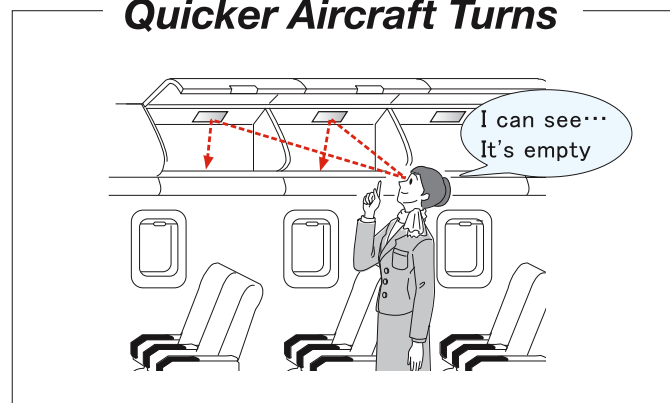
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# safetyfirst

Schroth Safety Products, the German-American manufacturer of crew restraint systems and commercial passenger lap belts, has announced its participation at Aircraft Interiors Expo 2014 in Hamburg, Germany.

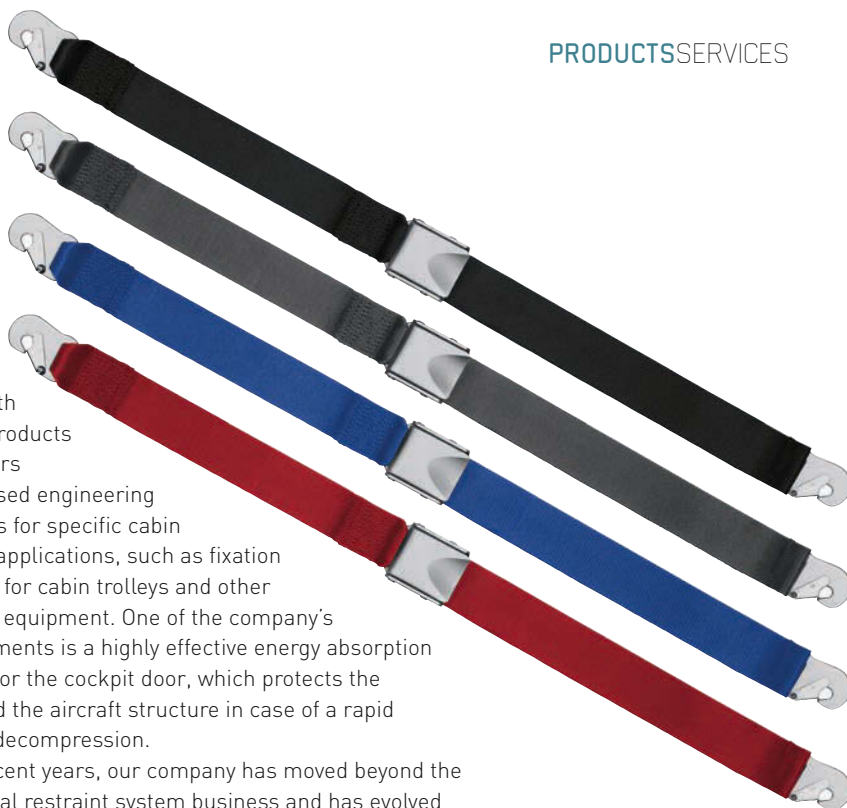
The company will present its latest restraint designs and technology innovations for improved safety on board. Exhibits will include the ultra-lightweight Schroth AirLite passenger lap belt, which – due to its great fuel-saving potential – has already been chosen by many leading airlines for their aircraft cabins.

Stefan Willeke, manager of aviation programmes at the company, says, "We have been seeing a tremendous amount of interest in our range of AirLite passenger lap belts. Our customers are enjoying considerable cost benefits from this innovative lightweight product. In combination with our premium customer service, the AirLite provides extraordinary value for airlines of any fleet size."

Schroth Safety Products will also present inflatable restraint technology for the improved safety of aircraft crew and passengers; interior and cargo nets for Part 23 and Part 27 aircraft; as well as a great variety of refined and plated restraint systems for individually designed VIP and business jet interiors.

Schroth Safety Products also offers customised engineering solutions for specific cabin interior applications, such as fixation systems for cabin trolleys and other onboard equipment. One of the company's developments is a highly effective energy absorption system for the cockpit door, which protects the crew and the aircraft structure in case of a rapid cockpit decompression.

"In recent years, our company has moved beyond the traditional restraint system business and has evolved into a supplier of sophisticated aircraft safety solutions. We are proud to see our products fly as standard equipment on many of our customers' present and future aircraft," says Martin Nadol, head of programmes at Schroth Safety Products.



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# likenew

The aviation industry, like many other sectors, is greatly concerned about perceived quality and uses adequate protection to avoid possible costly replacements. For example, maintaining the carpet of the passenger cabin in impeccable condition, for more than a couple of months, is quite a challenge.

To prevent further damage of carpets before the completion of cabin checks (involving, more often than not, the replacement of the aisle carpet), Adhetec offers a reliable self-adhesive protection foil that has been a great success among VIP completion and maintenance centres, as well as MROs handling cabin checks of five-star airlines, especially if a lot of staff traffic and the use of mobile tool trolleys is expected in the aisles.

This transparent PE film is anti-slip, thick enough to be tear-resistant, remains in place, and does not damage carpet fibres when removed at the end of the check, even after several weeks. It is supplied to

accommodate the average 2ft width of cabin aisles and is compliant with flammability requirements (CS 25/FAR 25.853), allowing it to be used during ferry flights before redelivery of the aircraft.

Given the many uses and application conditions of adhesives, Adhetec has developed an extensive range of residue-free adhesive films to cater for the protection of each surface inside the cabin. Each material ensures protection against dust, scratches and sometimes UVs, as discolouration of exclusive fabrics or veneers may occur when the cabin is exposed to direct sunlight through the windows. The foils are available in rolls or customised individual pieces.

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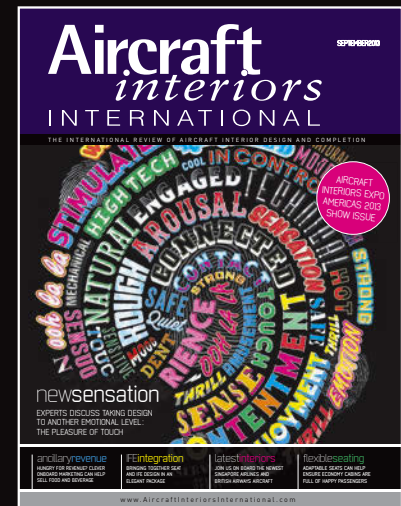
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# rollover

For engineers designing aircraft interiors, there are several common goals, the main being reducing weight. However, this is not the only challenge engineers face when selecting bearings. They also need to minimise fire risk and select products that can take a high static load while having the option to develop custom solutions.

Throughout an aircraft cabin there are thousands of bearings, with the seats themselves containing numerous examples. Bearing systems can also be found in footrests and armrests, as well as in other points around the cabin such as partitions, cable management and door deployment.

Whereas roller bearings have traditionally been the most popular amongst aircraft engineers, they have two main downsides: they are heavy and need lubrication. It is to overcome such challenges that the development of high-performance plastics has now opened up new opportunities in the field of plain bearings; tribologically optimised material components now permit the production of polymer plain bearings that are completely



self-lubricating. Unlike metal bearings, which are prone to corrosion and thus need constant oiling or greasing, glide elements and counter-rotation partners made of tribo-plastics ensure optimum wear and friction coefficient characteristics. More importantly for aircraft engineers, plastic bearings tick the two important boxes of weight saving and, with no lubricants required, reduced flammability. Many of the igus polymer bearing materials are fully compliant with the V0 (vertical burn) approval, which is required for any material used in an aircraft seat of a certain size. In addition to the cost advantage of using plastic plain bearings, there are opportunities for further weight savings when it comes to the choice of shafts.

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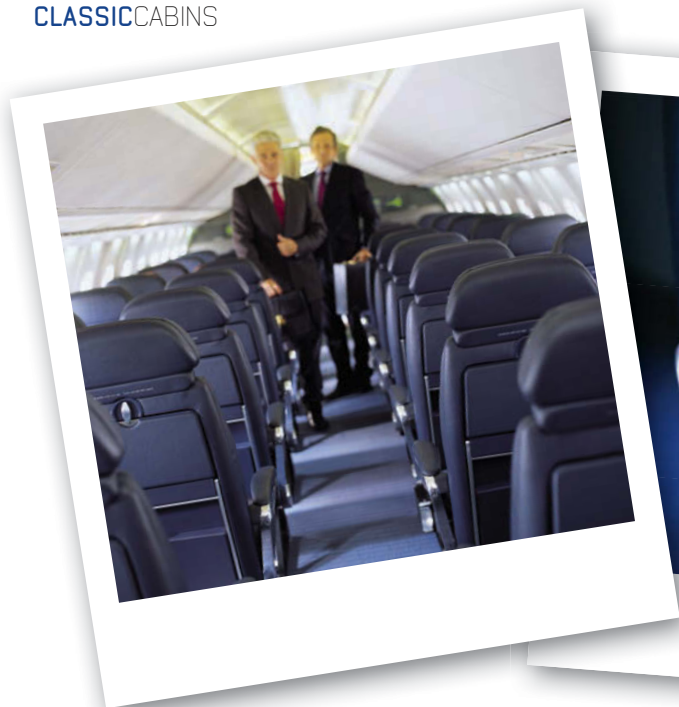
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17 years later, Paul Wylde and Factorydesign have collaborated again, on the new JetBlue interiors. See page 112

### SEVEN IN ONE

Adam White of Factorydesign found that working on Concorde's interior was a challenge, but even more so when they realised it was seven individual projects. "Every aircraft was different, and BA had seven of them," he recalls. "They were essentially handmade and the drawings existed in bank after bank of wooden plan chests, all drawn on thick vellum paper. So at times it felt like we were working on restoring a very fine classic car, rather than on a commercial aircraft."

# 1997:concorde

"Are you sitting down? I have some good news..." That phone call back in 1997 was a defining moment for a team of designers in London who had only set up their studio that year, as it was British Airways telling them that they had been selected to create the new interior for the world's most iconic commercial aircraft: Concorde.

The design team was Factorydesign, and the voice at the end of the line was Paul Wylde, then design manager at the airline (now owner of his own design agency), who was responsible for the overall creative direction and design management of the new Concorde experience.

The cabin design project – the third and, sadly, final incarnation – presented unique challenges. The magic of the exterior design, which, even at 30 years old, still looked incredible, had to be translated into the interior, while also conveying BA's conservative style. "The great irony about Concorde was that it was the oldest aircraft in the fleet but still commanded the perception of innovation and futurism," recalls Wylde. "We had to be true to its age, yet still position the brand as modern, relevant and unique."

The team was, of course, tempted to make the interior feel a little futuristic, but brand, product and perception research showed that 'classic contemporary' was more appropriate.

A five-hour flight on Concorde from London to New York was an expensive ticket – around US\$8,000-10,000 return – but the compact cabin meant that did not translate into the full first-class experience that B747 passengers enjoyed. "Concorde was a sports car, not a luxury SUV," says Wylde. "Less is more – Concorde was about buying time, not luxury. Unless something was truly needed, we would rather not have it in the cabin at all."

Adam White, one of the founders of Factorydesign, recalls how they carried that efficient ethos into the design of the bespoke double seat design, created with Britax Contour. "To match a philosophical approach we coined, if a visible part is not adding function, we don't want it on the seat."

Out went the aluminium fabrication, which had many parts held together by many more fasteners, and in came a one-piece carbon fibre seat, mounted on a frame that offered the strength needed to

do the job, but was styled well enough that the standard plastic and upholstered covers were no longer required. There was still scope for some flair and branding on the seat though, with the armrest mounted on an aluminium casting that was immensely robust, and styled and polished to look like BA's Speedmarque logo, a subtle way for the airline to 'own' the interior without obvious branding, which was another element of the original brief.

The previous seat models had a feature whereby the centre armrests could be pushed down to the seat pan to turn a double seat into a single, for the wider passenger or to afford extra comfort. However, the mechanism was deemed a little clunky and difficult to operate. Instead a twisting device was created in the mounting, so that as the passenger pulled the armrest up and out of the way, it automatically turned through 90°, which allowed it to slide between the seats. The radical rethink of the seat design, multiplied over 100 pax places (40 in the forward cabin, 60 aft), meant a significant weight saving was made overall.

The styling was intended to be timeless, calm and confident, with a subtle Connolly hide used on the seats, and Sir Terence Conran was brought in to work on some of the soft elements. However, a little of what White calls "wit and drama" was included to remind passengers of the marvel they were flying in, especially when the party piece of breaking the sound barrier occurred. "Given that every flight had 'once in a lifetime' on board, we wanted to give them a signal, some sort of sign that Mach 1 had been reached – but not something that would disturb the regulars," says White.

The team decided on blue LEDs incorporated into the ceiling lighting which, at the moment of passing Mach 1, sent a pulse of light from the front to the rear of the cabin. "If you were waiting, watching, on the edge of your seat, this was thrilling," says White. "If you were reading the *Wall Street Journal*, you didn't notice."

An incredible project, marrying technology with comfort, and a cramped cabin with some of the world's most demanding and highest-paying passengers. But as Wylde remembers fondly, "We all knew it was a once in a lifetime project and giggled throughout the programme. Just like kids at school." ☒

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