

Aircraft *interiors* INTERNATIONAL

NOVEMBER 2010

THE INTERNATIONAL REVIEW OF AIRCRAFT INTERIOR DESIGN AND COMPLETION

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PSYCHOLOGICAL RESEARCH AND TIMED
INSTALLATION CHECKS – BOEING SAYS
787 INTERIOR IS WORTH THE WAIT

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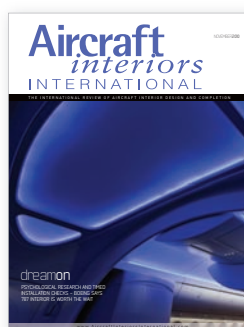
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Aircraft seating is a divisive subject at the best of times – first and business-class customers rarely agree on which airline offers the best product, while economy passengers remain critical of those that pack them in to ever tighter configurations, although the low-cost carriers most guilty of this show no signs of going out of business. However, a new generation of start-up airlines in the developing world threatens to go a step further – as our feature on page 34 reports, the idea of ‘stand-up seating’ refuses to go away. Its latest incarnation is in the form of Aviointeriors’ SkyRider concept, launched during the recent Aircraft Interiors Expo Americas in Long Beach, California. It spawned a predictable media frenzy, with television and newspaper reporters outraged at the prospect of travelling near upright while packed in like sardines.

However, when you compare this prospect with being crammed into an uncomfortable train carriage for ten times the journey time, it’s easy to see why in certain markets it makes more sense than the hysterical headlines suggest. That’s not to say that the idea does not face some major obstacles – Airbus and Boeing would need to be tempted by some serious orders to alter cabin systems and reinforce floors to the extent that such schemes would ultimately require. They’d also have to throw in some extra emergency exits, while the airlines themselves would face considerable certification costs.

Meanwhile the fallout from Koito’s admission that it falsified seat certification testing data continues to grow, with both the FAA and EASA preparing to issue Airworthiness Directives (ADs) that require airlines to test and potentially remove units supplied by the Japanese manufacturer. The stand-up seating debate only reinforces the importance of the highest possible safety standards – the consequences of a catastrophic structural failure of a conventional airline seat hardly need spelling out – just imagine the disaster this would imply on an aircraft fitted with high-density, near-vertical seating at 20in pitch.

But that’s not to say that current certification practices do not create rather absurd situations from time to time. Take the recent first delivery of the first Boeing 737 Sky Interior – to FlyDubai. After a lavish handover, the carrier flew the aircraft a few miles up the road to Everett-based Aviation Technical Services (ATS), which promptly ripped out its factory-fitted seats and replaced them with 189 Recaro units featuring Lumexis’ Fiber-To-The-Screen (FTTS) IFE system. I say promptly – it took 11 days as the first installation required complete recertification. However this will at least now be reduced to five days on all of FlyDubai’s subsequent 43 aircraft. ATS is so busy it’s in the process of hiring an extra 200 staff to cope with the work!

On the subject of highly anticipated deliveries, the 787 should finally make it into service next year. See page 26 for what passengers can expect on board – fortunately the cabin is designed with maximum comfort in mind!

Anthony James, editor

THE CONSEQUENCES OF A CATASTROPHIC STRUCTURAL FAILURE OF A
CONVENTIONAL AIRLINE SEAT HARDLY NEEDS SPELLING OUT

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dream on 026

From psychological research to timed physical installation checks, Boeing has gone to unprecedented lengths to make sure the interior of its 787 looks good, feels better and fits together perfectly

BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



features



034 space race

The attention surrounding the SkyRider seat that AvioInteriors showed at September's Aircraft Interiors Expo Americas prompts a closer look at an idea that refuses to go away

BERNARD FITZSIMONS,
AIRCRAFT INTERIORS INTERNATIONAL



042 warp speed

Priestmangoode had just 12 months to develop a new brand identity and interiors for one of Europe's fastest growing airlines

ANTHONY JAMES,
AIRCRAFT INTERIORS INTERNATIONAL



050 high drama

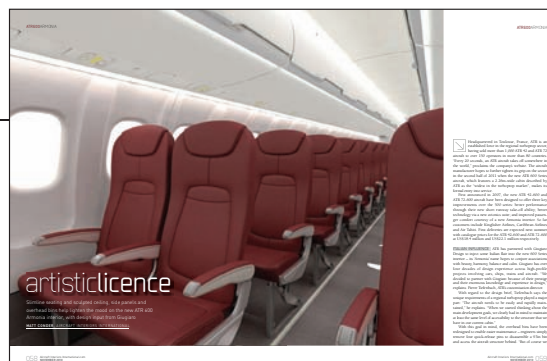
The fallout from Koito's admission that it has falsified seat testing data continues, with airlines asked to inspect and possibly remove seats currently in service

CHRISTINE NEGRONI,
AIRCRAFT INTERIORS INTERNATIONAL

artistic licence 058

Slimline seating and sculpted ceiling, side panels and overhead bins help lighten the mood on the new ATR 600 Armonia interior, with design input from Giugiaro

MATT CONDER,
AIRCRAFT INTERIORS INTERNATIONAL



shelf life 066

The use of commercial off-the-shelf (COTS) technology for handheld IFE is so over – or is it?

BRENDAN GALLAGHER,
AIRCRAFT INTERIORS INTERNATIONAL



074 go soft

New products and technologies from aviation's leather, fabric and flooring suppliers

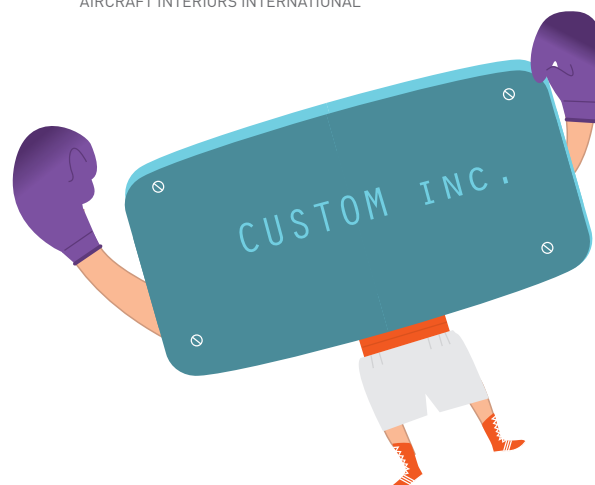
IZZY KINGTON,
AIRCRAFT INTERIORS INTERNATIONAL



078 light fantastic

A look at the latest lighting products designed to make the aircraft cabin safe, attractive and flexible

IZZY KINGTON,
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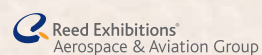
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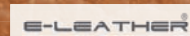
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JAL unveils latest business-class seat on new 767-300ER

Japan Airlines (JAL) has unveiled a brand new international executive-class seat – the JAL Sky Recliner – for its Boeing 767-300ER aircraft. The new 767s are also equipped with the most advanced version of JAL's IFE system, Magic V.

Modelled after JAL's domestic first-class seat, and manufactured by Koito, the JAL Sky Recliner boasts a 51in (129.5cm) pitch, reclines to 132°, and is arranged in a 2-2-2 layout. Features include an optional large partition, expanded pockets, and removable armrests. The seat comes

with a 10.6in (26.9cm) monitor, video input capability, USB port, and power outlet.

In other news, the airline will introduce premium-economy service on one of its two daily flights between Tokyo (Narita) and Bangkok, starting from 16 January 2011, using a Boeing 777-200ER aircraft that is also equipped with the airline's JAL Shell Flat seat in executive class. The JAL Sky Shell premium-economy seat features a shell-shaped sliding seatback, 9in (22.9cm) personal TV screen, power outlet, and is 20% more spacious than economy.

SAS to offer internet on both short- and long-haul routes

Scandinavian Airlines (SAS) will offer inflight connectivity, such as internet and mobile services, on both intercontinental and European routes. The service will be offered free of charge to business-class and Economy Extra customers, and as a fee-based option in economy. Broadband services will include full internet access, online shopping, movies and other video content, games, destination information and bookable services, and real-time flight information. "We are currently negotiating with a number of service providers and aim to offer our premium customers free internet on board our flights, starting already in April 2011," said Robin Kamark, chief commercial officer at SAS. "This inflight broadband system allows us to customise a suite of WiFi services for our customers – from movies and other entertainment for our leisure travellers to communication tools for our business travellers." SAS's Boeing 737s will be the first to have inflight connectivity installed, and initially offered on Norwegian domestic routes, and from Oslo and Stockholm to London, Frankfurt and Paris. In the first phase, nine B737s will offer the service.

Edelweiss Air adds new aircraft

Edelweiss Air is adding a new long-haul A330-300 to its fleet in spring 2011, as well as an A330-200 converted for the leisure flight market. The airline says that both aircraft offer an improved business-class cabin with 48in (121.9cm) pitch and IFE. The A330-300 will have 36 seats in business class, and 296 seats in economy; while the A330-200 has 30 seats in business and 255 in economy. The airline also refurbished three A320s this past summer, with new seats. To optimise flight schedules, SWISS's A321/320 flights will serve Edelweiss Air's leisure-flight destinations. In turn, Edelweiss Air's A320 will operate on the SWISS flight network.

Etihad begins all-economy service

Etihad Airways has begun operating its first all-economy-class aircraft. The A320 is configured to carry 162 economy-class passengers – 42 more than its previous economy capacity. The aircraft began operations from 31 October, flying to Calicut, Alexandria, Colombo, Thiruvananthapuram, Damascus, and Peshawar. "Customers travelling on the new all-economy aircraft will receive the same world-class service and product for which we are renowned, such as seatback IFE screens and hot and cold meals and beverages, as well as a 32in (81.3cm) seat pitch," said Hareb Mubarak Al Muhairi, Etihad Airways' vice president of sales.



Air France is upgrading its business-class offering by introducing a new seat and a greater choice of food. The new fixed-shell business-class seat converts to a lie-flat seat bed measuring over 2m in length, and 24in (61cm) wide. The airline says the B/E Aerospace seat, set at 61in (155cm) pitch, also features an integrated fixed footrest, adjustable headrest, simpler and more practical controls, new storage space, and a 15in 16:9 format widescreen for access to over 500 hours of IFE programming.

Business-class passengers can also make use of an electric 110V plug, reading light, noise-reducing headset, anti-allergy feather pillow, pure wool blanket, and an amenity kit containing travel socks, a sleeping mask, earplugs, shoe bag, shoe

Air France upgrades long-haul business class

horn, earphone covers, toothbrush, comb and a Clarins skincare product.

Starting in summer 2011, over 20 aircraft will be equipped with these new cabins. The airline plans to fit some 40 Air France aircraft (A330, B777 and A380s) by 2013. In addition, over the past few months, Air France has been updating its catering service in business class, offering new dishes and renewing its menus more frequently.

Cathay Pacific screens full seasons of top TV shows

Passengers on all long-haul and some regional Cathay Pacific flights can now watch full seasons of eight comedies and dramas – available in all cabins, on demand, and in digital widescreen format, via the airline's StudioCX AVOD IFE system. The shows include *Mad Men*, *Californication*, *30 Rock*, *Scrubs* and *The Thick of It*, with more to be added in the coming months. November's line-up also includes blockbusters such as *Inception* and *Salt*, along with sports specials including highlights from the 2010 FIFA World Cup, and England's FA Premier League.

Gulf Air takes delivery of 12 new aircraft in 12 months

Gulf Air took delivery of two new Embraer 190-100 aircraft in October 2010, taking the number of new aircraft in the airline's fleet to 12 in the last 12 months. The new Embraer 190-100 is fitted with 12 Falcon Gold and 84 economy seats, with leather upholstery throughout the aircraft and no middle seats. The aircraft also features individual seatback TV screens and an AVOD IFE system with over 3,000 video titles and audio channels. The two newly delivered E190-100s will be used to serve intra-Gulf and regional routes on Gulf Air's network.

Flatbeds and AVOD to grace SriLankan long-haul business class

SriLankan Airlines says it will soon equip its long-haul fleet with flatbed seating and AVOD IFE in business class. Two of the airline's existing A340 aircraft and four of its A330 aircraft will be fitted with flatbed seating from Aviointeriors, commencing in May 2010. The cabin conversion will be carried out at SriLankan's engineering facilities at Colombo's Bandaranaike International Airport, and it anticipates completion by September 2011. In addition, the existing IFE system will be replaced by AVOD IFE from IMS. "SriLankan will be one of the few airlines in the world to offer flatbed seats in business class on flights to Europe and other long-haul destinations," said Captain Milinda Ratnayake, head of service delivery at the airline. SriLankan's latest aircraft – an A330 – has lie-flat seating in business class, which is almost to the standard of the flatbeds. SriLankan has steadily upgraded its business-class service in the past year, introducing an improved meal service, award-winning wines, and signature cocktails. The airline also provides a second meal, à la carte, which a passenger can request at any time on a flight.

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Turkish Airlines unveils premium economy with first 777-300ER

Boeing has delivered the first of 12 777-300ERs ordered by Turkish Airlines. The aircraft is the platform for introducing the airline's new Comfort Class (premium economy) cabin.

The Comfort Class cabin features 63 seats in a 2-3-2 configuration. The Recaro seats boast 46in (116.8cm) pitch, 19.5in (49.5cm) width, and 8.5in (21.6cm) recline.

In business class, the 28 Contour seats are laid out in a 2-3-2 configuration with pitch at 78in (198.1cm), width at 22in (55.9cm), and 177° recline. The 249-seat economy cabin has a 3-3-3 configuration. The Weber seats have a 31in (78.7cm) pitch, 18in (45.7cm) pitch, and 6in (15.2cm) recline.

Panasonic's eX2 IFE system is available throughout the aircraft.

Continental introduces meals and snacks for purchase

Continental Airlines has unveiled a new menu available for purchase in economy class on select flights on many US, Canadian and certain Latin American routes. The menu replaces the complimentary meals and snacks previously served in economy on these routes. Offerings include Asian-style noodle salad; grilled chicken spinach salad; Angus cheeseburger; and Jimmy Dean sausage, egg and cheese sandwich. Snack and dessert options include a cheese and fresh fruit plate; several types of snack boxes; à la carte brand-name snacks; and chocolate-covered Eli's Cheesecake on a stick. Prices will range from US\$1.50 (£0.93) for Pringles Original Potato Crisps to US\$8.25 (£5.12) for the grilled chicken spinach salad.

Southwest Airlines announces introductory WiFi pricing

Southwest will offer WiFi on its fleet at an introductory flat rate of US\$5 (£3.12) per flight for any device or flight length. The airline partnered with Row 44 and began testing WiFi on four aircraft in 2009. Southwest plans to have 60 WiFi-enabled aircraft by the end of 2010, and its entire fleet of 737-700s (346 aircraft) enabled by the end of 2012. "Southwest tested a number of different pricing points throughout this process and is pleased that we will offer one low fee for this service, making it easy for customers to know what to expect," said Dave Ridley, vice president, marketing and revenue management at Southwest. Customers will receive an email prior to their flight informing them they will be on a WiFi-enabled aircraft.

Thales launches Touch Passenger Media Unit built on Android OS

A new touchscreen unit from Thales, the Touch Passenger Media Unit (TouchPMU), is designed to be both a standalone media access device and a controller for the seat display. Built on the Android operating system, TouchPMU boasts an open source, web-based platform designed to make it easy to integrate functionality and leverage existing gaming and application resources. As a standalone media access device, the TouchPMU stores applications independently of the TopSeries system. Passengers can watch the moving map, order food and beverages, play games, take a survey, shop and chat while at the same time engaging with the seatback menu options. As a controller for the display, the unit enables the passenger to browse all system functions through a touchscreen interface. The TouchPMU is a handheld 3.8in LCD display unit with resolution of 800 x 480 pixels. Touch capabilities include two-finger pinch for expanding and reducing picture or menu sizes, finger swipe for turning menu pages, and two-finger rotation to adjust viewing orientation. The unit provides 3D graphics acceleration as well as an accelerometer for 3D graphic rotation and support for local games and applications. In the future, the product will include an Adobe Flash player.

Dubai-based flydubai has received the first Next-Generation Boeing 737 with the new Boeing Sky Interior. Flydubai's aircraft, a Next-Generation Boeing 737-800, was delivered by Boeing and then flown to Aviation Technical Services (ATS) in the USA, where the factory-fit seats were replaced by 189 Recaro seats – all economy class – and Lumexis' Fiber-To-The-Screen (FTTS) AVOD IFE system.

The aircraft is the first to enter revenue service fitted with FTTS. "This first-of-type installation for both AVOD system and aircraft was accomplished in an unprecedentedly short 11 days from receipt of aircraft at the mod site to delivery of the aircraft back to the customer with its STC," said Doug Cline, CEO of Lumexis.

"Obviously, that required strong support from our customer and extremely close cooperation between seat manufacturer Recaro, installation/certification contractor JAMCO, and installation services provider ATS. Since follow-on aircraft will not require further certification, flydubai's future installations can be reduced to less than five days."

Standard economy seat pitch is 29-31in (74-79cm); however extra legroom seats offer up to 8.7in (22cm) more space. Passengers can reserve a seat with extra legroom for AED 100 (£16.92/US\$27.23).



Boeing delivers first 737 Boeing Sky Interior, to flydubai

Wataniya Airways and Azerbaijan Airlines go for digEcor PMPs

Wataniya Airways has begun offering portable media players (PMPs) to all its premium-economy and Business First passengers travelling to Europe. The media players, supplied by digEcor, offer over 300 hours of entertainment, including Hollywood movies with Arabic subtitles, Arabic movies, Arabic and English television programming, music, music videos and games. The new system is available to guests travelling on long-haul flights to Vienna and Istanbul, with a full fleet-wide roll out to follow. The system is available free of charge for all premium-economy passengers. Business First passengers will continue to receive their usual in-seat entertainment, with the new PMPs available upon request. Meanwhile Azerbaijan Airlines has signed on as the newest digEplayer L7 customer. Passengers flying business class on select flights will receive the players as an amenity. The L7 is the product of a joint venture between digEcor and Lefel Media Technology.

TAM, Singapore, Egyptair and AirAsia opt for OnAir

Brazilian carrier TAM Airlines has begun offering inflight mobile communications in collaboration with OnAir. Based on Inmarsat SwiftBroadband, the high-capacity service is now available to passengers travelling on TAM's A321 aircraft operating between Guarulhos, Recife, Natal, Fortaleza and Porto Alegre. The service allows as many as eight passengers to make and receive calls simultaneously on a flight with no limits on data and text messaging. The company plans to equip more aircraft on domestic routes with the technology starting in 2011. Other recent OnAir contacts include a multimillion-dollar collaboration with Singapore Airlines for passenger WiFi internet and mobile telephony services, to be rolled out from the first half of 2011 on A380, A340-500 and B777-300ER aircraft. OnAir also recently went live with Egyptair (full Mobile OnAir and Internet OnAir passenger communications); and AirAsia (on A320s on southeast Asian routes from Kuala Lumpur).

Delta to fit two-class B747-400 fleet with new interiors

Delta Air Lines plans to revitalise its fleet of B747-400 aircraft flying primarily from Tokyo-Narita. Between the summer of 2011 and 2012, Delta will equip each of its 16 B747-400s with 48 flat-bed seats in BusinessElite, and 338 new economy-class seats featuring on-demand IFE. The new BusinessElite seat, manufactured by Weber Aircraft, will be 81.7in (207.5cm) long and 20.5in (52.1cm) wide, similar to the flat-bed product currently offered on Delta's B777-200LR fleet. It will also feature a 120V universal power outlet, USB port, personal LED reading lamp and Panasonic's 15.4in (39.1cm) personal video monitors. Economy class on the B747-400 will feature a new seat designed by Weber Aircraft and Panasonic. The seat's embedded touchscreen IFE system will offer access – via a 9in (22.9cm) screen – to 250 films, hundreds of television shows, 4,000 digital music tracks, music playlists, games and a USB port. Delta says the new seats offer up to 1.5in (3.8cm) more personal space.

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ADVANCED AVIATION PRODUCTS



Iberia launches new business class for medium-haul flights

Iberia has unveiled a new seat for business travellers on the airline's longest medium-haul flights. The new Business Club cabin is installed on five A319 aircraft, which also feature economy-class cabins. These aircraft fly on routes between Madrid and Cairo, Lagos, Malabo, Moscow and Tel Aviv.

The Business Club section consists of 14 seats in a 2-2 configuration. The seats are a new design by Aviointeriors, with adjustable backs, four-position headrests, legrests and footrests. The seats boast 50in (127cm) pitch, are 21.7in (55cm) wide, and also feature individual coat hooks and a number of spaces for passengers to stow personal items.

Each Business Club passenger can use the latest PlayStation Portable (PSP) to watch high-definition films or television series, or to listen to the 10 audio channels. The PSP housing allows it to stand on the fold-down table in front of each seat. Business Club passengers will also be given an exclusive toilet kit, and

can use a soft pillow and matching double-sided blanket. The new, more elaborate Business Club meal service features main dishes created by Sergi Arola, who also designed Iberia's Business Plus menu. A selection of Spanish wines is offered to business passengers on both medium- and long-haul flights.

The new class is part of Iberia's Strategic Customer Service Improvement Plan, which led to the redesign earlier in 2010 of the Business Plus class on the airline's long-haul flights.

Business Club passengers also get an extra luggage allowance and priority in luggage collection, exclusive check-in facilities, and three days' free parking at Madrid or Barcelona airports. They may also use the new VIP lounges, which incorporate conveniences for relaxing or working, a hot and cold buffet and a self-service bar. Iberia's Business Club passengers also get fast-track treatment in security control and earn extra Iberia Plus frequent flyers points.

airberlin offers kosher meals

airberlin now offers kosher food on all flights to and from Israel. Passengers have a choice of three different bagels. A hot meal created by Franz Raneburger can be pre-ordered at an extra charge. All ingredients are kosher or 'la-mehadrin'. The bagels and hot meals are produced by Top Kosher & Gourmet, and inspected by Rabbi Yitshak Ehrenberg of the Jewish Community in Berlin.

Royal Jordanian adds SiT AVOD IFE

Royal Jordanian has modernised the cabin of the first of its four A340s serving North American destinations. Royal Jordanian is the first airline to equip its aircraft with Seat Integrated Technology (SiT), the new AVOD IFE system developed by Zodiac Aerospace. 229 economy-class seats were replaced with new seats and equipped with SiT, while the 24 Crown Class (business) seats were modified to suit the SiT product. Seat pitch is 33-34in (83.8-86.4cm) in economy, and 82in (208.3cm) in Crown Class. The airline is expected to finish renovations on all four A340 fleet by mid December 2010.

BAE Systems and design consultancy Design Q have unveiled their latest concept (the third of five commissioned) for the Avro Business Jet (ABJ). The ABJ Fusion is aimed at the charter aircraft market – product launches, sports teams, musicians, celebrities, exclusive travel, and corporate VIP markets – and is designed to encourage passengers to socialise during the flight.

The open-plan interior incorporates separate lounges, with a bar and seating area located half way down the cabin. The interior can seat 19 passengers within the three lounges. The mood lighting system allows each lounge to be lit independently, creating individual accents to reinforce the way the lounge is being used at any one time. The forward lounge has a 50in HD television monitor mounted on an offset and angled bulkhead, which also allows for a large forward VIP lavatory. A discrete library is also incorporated into the forward lounge, while the rear lounge features an informal seating layout along with club-four and club-two seating areas at the aft end. The lounge backs on to an open galley.

The remaining two ABJ interior concepts are scheduled for unveiling in late 2010 and early 2011.



BAE Systems and Design Q unveil ABJ Fusion concept

Lufthansa Technik and Panasonic combine forces for IFEC and CMS

Lufthansa Technik and Panasonic have signed a letter of intent to establish a joint venture for the development, manufacture and sale of IFEC and cabin management systems (CMS) for VIP aircraft. These new solutions will be based on technologies from Panasonic's X Series commercial IFE and Global Communications Suite (eXConnect and eXPhone) and the nice CMS/IFE system developed by Lufthansa Technik's Innovation Business Unit. Efforts will be primarily aimed at narrow- and wide-body VIP aircraft and will incorporate digital distribution, HD playback, iPod and iPhone controls, remote maintenance, high-speed connectivity, ipTV, media and game libraries and more.

Gulfstream reveals G250 and G650 interiors

Gulfstream has unveiled interiors for the G250 and G650. The G250 boasts a cabin management system (CMS), HD IFE system and 19 windows. New seats are 25in (63.5cm) wide with 21in (53.3cm) between the armrests, creating an aisle nearly 2ft wide. They feature a telescoping headrest with optional flexible wings, an articulating seat pan for full-flat berthing; and an optional recliner-style legrest. Meanwhile the G650 features CMS, a large galley and 16 windows. For the first time in a Gulfstream aircraft, two of the standard seats are electrically operated. The G650 also offers a divan that converts to an 80 x 41in (203.2 x 104.1cm) flat surface, and a crew rest area.

Iacobucci HF enters seat market with BMW Group DesignworksUSA

Iacobucci HF Electronics has entered a new market with the launch of a VIP seat designed by BMW Group DesignworksUSA. A new business unit and team were created by Iacobucci HF to manage this new product line, initially targeted at the business jet market. The seat, which converts to a fully flat bed, features a single backrest, a height of 45-46in (114.3-116.8cm), and a 7in (17.8cm) extendable legrest. The new seat is manually operated, but electronic controls can be installed as an option. It was designed to boast a light structure and smooth movement, and can be customised to suit individual needs and fit a variety of cabin interior designs.



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rotationpolicy

BRIEF: Seymourpowell is proposing a new seat layout system designed to offer far greater flexibility over current layouts by allowing airlines to offer both privacy and conviviality, depending on passenger demand – per flight. The London-based design agency says the concept is equally relevant to the high-speed long-distance rail sector.

DESCRIPTION: “The core of the idea allows two (or more) sets of seats to face another two sets of seats creating a so called ‘bay’ or club seating system where people can share the space in a convivial manner,” explains Nick Talbot, design director at Seymourpowell. From this arrangement of shared space, by rotating two (or more) of the seats (one of the facing pairs for example) by an angle sufficient to turn the occupant away from the seat in front of them, the layout changes to two sets of facing seats with an immediate level of privacy between the two facing pairs of seats, or ‘cocoons’. Furthermore, for those travelling alone, from the original bay arrangement of two (or more) sets of facing seats, a single seat can be rotated to face away from the seat in front, providing privacy for a single occupant, whilst allowing conviviality for the remaining set of three occupants. The system enables facing pairs, facing quads, and single seats in a line (so called airline style). With the addition of utility units and appropriate lighting, both the physical space and the relevant ambience can be changed very easily to suit customer preference and mood. The design also potentially allows for the conversion from a meeting or dining space to a set of sleeping spaces. “If the rotated seats are designed to convert to loungers or beds, it is possible for an operator to offer a convivial space that can be converted to a private resting or sleeping space.”



VERDICT: While omni-directional and fold-over seats have existed for years, this design responds to an increasing need to offer travellers the choice of sitting with others in a sociable space or in the privacy of a separate zone. The concept's flexibility doesn't end there: “It may be that the same vehicles could offer a different service with higher density bays in the daytime and a lower density super-premium sleeper service according to demand and routeing requirements,” adds Talbot. “This innovation provides flexibility for both operators and passengers.” ☒



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factfile:turkish

AIRCRAFT TYPE	A330-203 (TYPE 1)	A330-203 (TYPE 2)	A330-300 (TYPE 3)	A340-311/313 (TYPE 1)	A340-311/313 (TYPE 2)
No. of aircraft	2	5	7 (5 still to be delivered)	7	2
Entered service/last refurbishment	May 2009	December 2005	September 2010	Refurb July 2008	September 2009
Total seats	281	250	261	270	278
Number of seats	22	22	28	34	26
Configuration	2-2-2	2-2-2	2-2-2	2-2-2	2-2-2
Seat pitch	55in (139.7cm)	61in (154.9cm)	76in (193cm)	60in (152.4cm)	73-77in (185.4-195.6cm)
Seat width	20in (50.8cm)	20in (50.8cm)	22in (55.9cm)	20in (50.8cm)	20.5-21in (52.1-53.3cm)
Seat recline	158°	159°	177°	159°	150°
Seat supplier	Sogerma	Sogerma	Contour	Sogerma	Sogerma/Weber
IFE system	TES	System 3000i	eX2	System 3000i	System 2000E
IFE supplier	Rockwell Collins	Panasonic	Panasonic	Panasonic	Panasonic
Business class					
Number of seats	259	228	261	236	252
Configuration	2-4-2	2-4-2	2-4-2	2-4-2	2-4-2
Seat pitch	33in (83.8cm)	33in (83.8cm)	31in (78.7cm)	33in (83.8cm)	33-34in (83.8-86.4cm)
Seat width	17.7in (45cm)	17.5in (44.5cm)	18in (45.7cm)	17.5in (44.5cm)	17.1-17.7in (43.4-45cm)
Seat recline	6in (15.2cm)	6in (15.2cm)	6in (15.2cm)	6in (15.2cm)	6in (15.2cm)
Seat supplier	Recaro	Weber	Weber	Weber	B/E Aerospace
IFE system	TES	System 3000i	eX2	System 3000i	System 2000E
IFE supplier	Rockwell Collins	Panasonic	Panasonic	Panasonic	Panasonic
Economy class					

AIRCRAFT TYPE	B777-300ER (TYPE 1)
No. of aircraft	4
Entered service/last refurbishment	June 2009
Total seats	312
Number of seats	8
Configuration	1-2-1
Seat pitch	90in (228.6cm)
Seat width	22in (55.9cm)
Seat recline	180°
Seat supplier	B/E Aerospace
IFE system	eX2
IFE supplier	Panasonic
First class	
Number of seats	30
Configuration	1-2-1 herringbone
Seat pitch	49in (124.5cm)
Seat width	23in (58.4cm)
Seat recline	180°
Seat supplier	Contour
IFE system	eX2
IFE supplier	Panasonic
Business class	
Number of seats	274
Configuration	3-3-3
Seat pitch	32in (81.3cm)
Seat width	18in (45.7cm)
Seat recline	14.3°
Seat supplier	Recaro
IFE system	eX2
IFE supplier	Panasonic
Economy class	

AIRCRAFT TYPE	B777-300ER (TYPE 2)
No. of aircraft	12 (10 still to be delivered)
Entered service/last refurbishment	October 2010
Total seats	337
Number of seats	28
Configuration	2-3-2
Seat pitch	78in (198.1cm)
Seat width	22in (55.9cm)
Seat recline	177°
Seat supplier	Contour
IFE system	eX2
IFE supplier	Panasonic
Business class	
Number of seats	63
Configuration	2-3-2
Seat pitch	46in (116.8cm)
Seat width	19.5in (49.5cm)
Seat recline	8.5in (21.6cm)
Seat supplier	Recaro
IFE system	eX2
IFE supplier	Panasonic
Premium-economy class	
Number of seats	246
Configuration	3-3-3
Seat pitch	31in (78.7cm)
Seat width	18in (45.7cm)
Seat recline	6in (15.2cm)
Seat supplier	Weber
IFE system	eX2
IFE supplier	Panasonic
Economy class	

HEADQUARTERS: Istanbul, Turkey

PASSENGERS CARRIED IN 2009: 25.1 million

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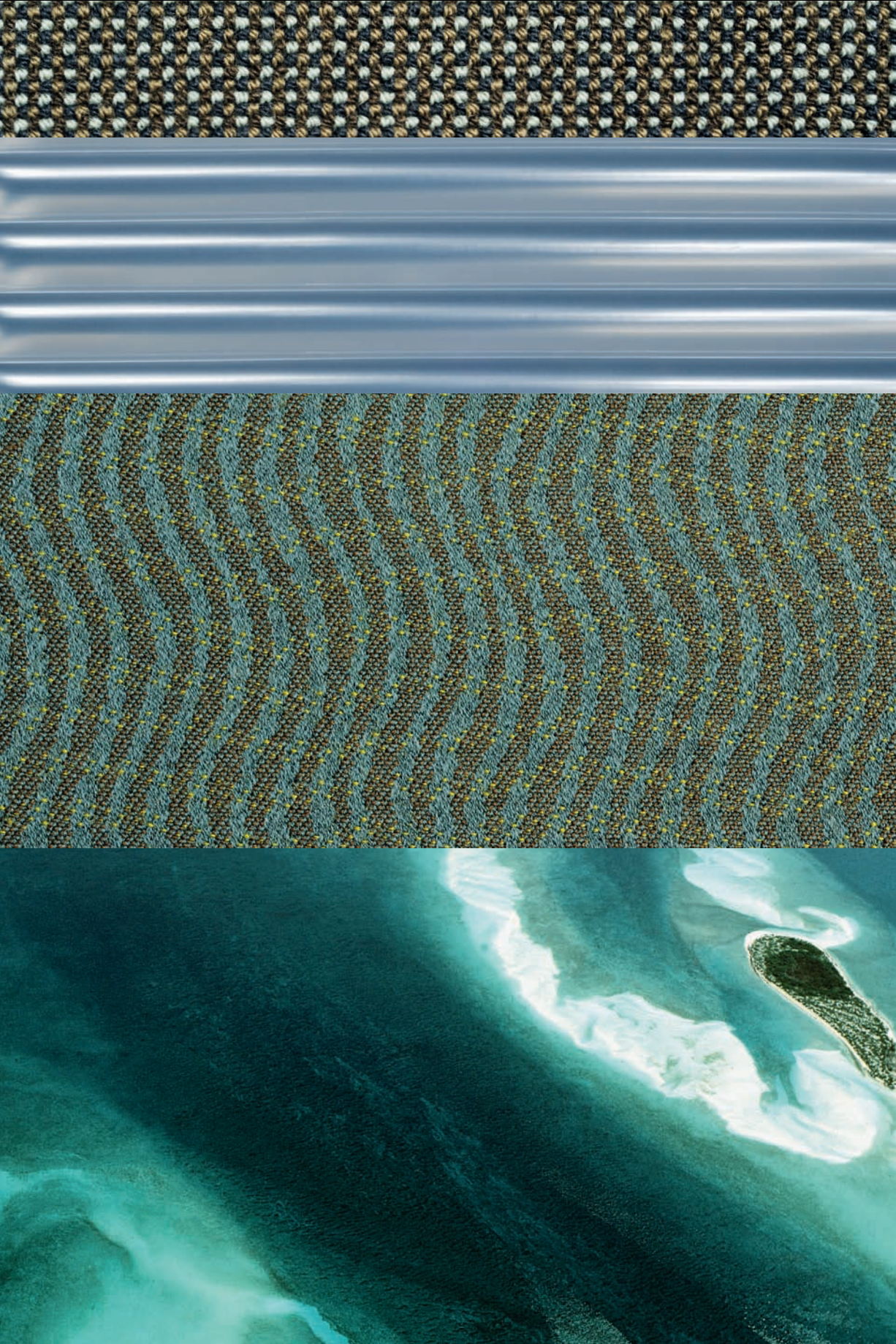
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* Information shown represents Turkish Airlines' long-haul fleet. The airline also has four A319-100s, 25 A320-232s, two A321-211s, 15 A321-231s, four A321-232s, three B737-400s, 13 B737-700s, and 52 B737-800s.



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dreamon

From psychological research to timed physical installation checks, Boeing has gone to unprecedented lengths to make sure the interior of its 787 looks good, feels better and fits together perfectly

BERNARD FITZSIMONS, AIRCRAFT INTERIORS INTERNATIONAL




 The standard features of Boeing's 787 interior, with its entry arch, dynamic lighting system, bigger bins and lower cabin altitude, are fairly familiar by now. But it is the windows – bigger, higher and electrically dimmable – that tend to recur in a discussion with the men behind it. “The reveal around the window really is one of the most beautiful aspects that a passenger will see from the seated position,” says Tom Galantowicz, 787 interiors director. “Their size and location give a really remarkable view of the flight. One of the really key aspects is that any passenger can see out the windows. And there’s

nothing like the dimmable window – there’s no comparison to a shade, because you can have it at a setting where you can still see through the window yet not disturb the other passengers around you.”

PSYCHOLOGICAL INPUT The dimmable windows can trace their roots back to psychological research carried out by director of differentiation strategy Blake Emery, whose input was particularly influential from an architecture standpoint, says Galantowicz. “He defined these emotional aspects that have to translate into design,” he explains. “So

“

THERE'S A GREAT ATTENTION TO DETAIL...
WITH THE INTENT OF MAKING THE BOARDING
PROCESS AS WELCOMING AND ENJOYABLE
AS POSSIBLE ”

01

balancing act

Seattle-based industrial design firm Teague played a crucial role in realising the Dreamliner's interior. "I have worked with Teague for over 20 years," says interiors director Tom Galantowicz. "They really are, and especially were on the 787, an important partner for us in designing new interiors."

Teague plays a collaborative role, he says, particularly in terms of concept development: "Some of the skills that they bring, especially in industrial design, are incredible. They have the ability to do artistic renderings of concepts, they help us with pre-production mock-ups of ideas, and that role and those skills help us take basic ideas and give them a little more shape and form so that it accelerates the design solutions."

The company also brings an artistic and functional view of design that is broader than just aerospace, he adds. "Their view of design and parts often brings a perspective that is different from what a typical engineer might be thinking about. They help us generate ideas in a more free-flowing manner, they help us find new solutions to old problems, and to me they help with the balance of engineering products being artistic and functional yet producible. They help with the balance across those aspects."

the window size and location, the significance of open space and the entry area are fundamentals that were rolled into the 787 to help create the effect we were looking for. He created this palette by which we did our detailed design and executed around the architectural ideas that came from the research."

One of the goals was a sense of welcoming through the entry area, continues Galantowicz. "There's a great attention to detail in the high ceilings, the arch and the lighting system in the entry area with the intent of making the boarding process as welcoming and enjoyable as possible." The increased stowage space, too, has emotional as well as practical value: "One of the things that creates anxiety is the ability to stow things."

Meanwhile the dynamic lighting system enables airlines to adjust the colours to be, for example, calming for sleep or during the meal service.

CATALOGUE SHOPPING Standard features aside, customer options give the airlines a lot of flexibility, with options for lavatories, galleys and their location. Along with economy-class seats, IFE systems and crew rests, "the rest of what it takes to configure an interior is selected by the airlines in terms of overall cabin configuration, the number and type of closets, partitions, attendant seats, and the colours of carpets and interior features," says Galantowicz.

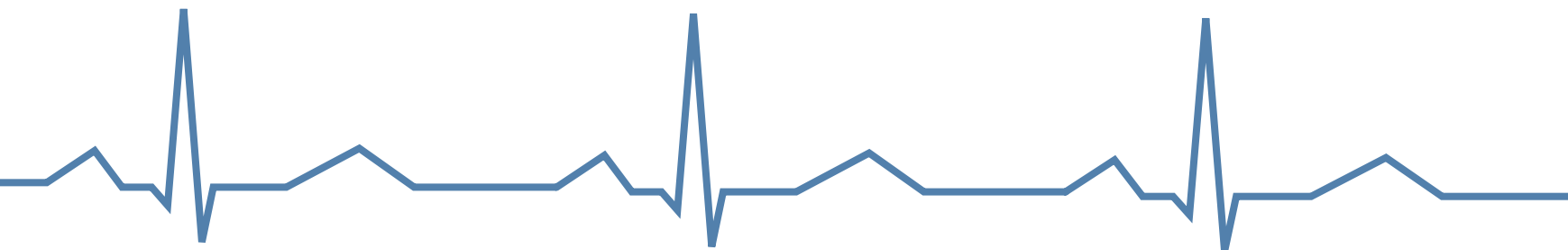
Those selections come from a catalogue of items chosen by Boeing. "We set up the catalogue to meet the airline requirements," adds senior 787 cabin systems manager Sean Sullivan. "And we did that as much as possible with a broad selection of the features the airlines care most about, such as seats, IFE, lavs and galleys."

The motive for setting up the catalogue, he says, was to meet market demand while supporting the unprecedented

01. Welcome aboard – psychological research underpins the 787's whole design philosophy

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production rate planned for the 787, “and setting us up for a lean production system, having the stability through both Boeing and the supply base to ensure that we could always meet the production requirements, quality requirements and continuously reduce our flow times. The airlines always want to make their decisions as late as possible, so we’ve tried to set up a stable system that would enable that.”

There has been a high degree of acceptance of catalogue features: “We feel the catalogue has been very successful in terms of satisfying the airlines’ requirements,” says Galantowicz. “More than 95% of all their selections have come from our catalogue offerings. I think we feel really good about the economy-class seats and how popular they’ve been.” Crew rests have also proved very popular.

The airlines have some flexibility outside the catalogue, “but it’s very constrained in terms of what other options they might be able to choose,” continues Galantowicz. “The passenger seats in the catalogue are our sole offering of economy-class seats.” The principal off-catalogue items are more peripheral equipment such as service carts and galley inserts: “Because of airline infrastructure we’ve accepted airlines’ carts and trolleys as an outside-the-catalogue item.”

REFRESH RATE The catalogue is not static, though. “We’re always looking at the right market demand in terms of our catalogue requirements,” says Galantowicz. “Often the best market indicator of what’s needed comes from airline feedback, and we use that to refresh our catalogue.” Sullivan quotes the example of iPod jacks: “iPods didn’t even exist when the 787 started, now in-seat iPod jacks are an expected feature, so we have used the catalogue refresh process to introduce them into seats where we have a market for them.”

There are defined criteria for a catalogue feature, says Sullivan. “It has to have sufficient market interest that it’s a good business for everyone involved. The airline doesn’t want to pay all the cost for something that’s going to have broad appeal, the suppliers don’t want to create unique things for the 787 because the costs are so prohibitive. So we want to have a good market for something before we standardise it and put it in our catalogue.”

The catalogue refresh process is continuous: “We have a number of areas where we get information on likely trends,” explains Sullivan. “We stay close to the consumer electronics market, we stay close to the interiors shows to see trends, we try to anticipate trends and we develop strategies around that. We also take into account airline input. The airlines recognise the need to identify these things earlier than they probably would have on another airplane, so we have airlines engaging us very early in their process and trying to collaborate with us on new features. All those influences help us pick good catalogue features.”

The printed catalogue is updated on a sporadic basis, with customers informed by letter of any addition or change: “It’s an ongoing refresh.”

EASY FIT “The galleys just dropped in and bolted down with no shims,” said one senior 787 interior manager earlier this year. “The rest of the installation has gone equally well,” says Galantowicz. “We’re really pleased with the ease with which major monuments such as lavs and galleys have been installed. We’ve also installed stowage bins, sidewall panels, ceilings, and the other major features have all gone in equally well.”

That was no accident. Sullivan quotes the example of premium seats: “We have expectations of how long it takes

02. Entryway lighting and ceiling panels are designed to create more of a welcome upon first boarding



supply and demand

The start of 787 production deliveries is unlikely to come too soon for the Dreamliner’s suppliers, who are still waiting for contracts awarded five or six long years ago to start bearing fruit.

For Astronics, whose in-seat power supply units support both the Thales and Panasonic IFE systems to the tune of around 75 units per shipset, every Dreamliner delivered is worth approximately US\$200,000, depending on options. The units provide power for both the in-seat IFE and passengers’ own devices.

“If Boeing sells a 787, we sell a cabin electronics system,” comments Astronics president and CEO Pete Gundermann. “We are already ahead of Boeing a little bit in the sense that we’ve delivered a number of shipsets. But as that production rate picks up, 100 shipsets a year is going to be a lot of content for us.”

For Zodiac Group, whose subsidiaries are supplying the water and waste system (Monogram Systems), escape slides (Air Cruisers) and sidewalls (C&D Aerospace) as well as pilot oxygen masks, cockpit instrument panels, windscreen wipers, the electrical distribution system, connectors and elements of the fuel system, the shipset value of each 787 is more than US\$2.5 million. And that is without counting seats from its Weber Aircraft and Sicma Aero Seat subsidiaries.



03. Premium seating can be selected from outside the catalogue

04. Entryway monument installed in mock-up



and we work with the supplier to make sure that the piece can be easily and quickly installed by our mechanics. It's a way for us to support the aircraft schedule by having an efficient way to install these things. That's new for the 787 – that's not been done before."

The basic approach has been to keep in mind the production requirements at their earliest stage of development. In the case of seats, he says, "often the installation aspects are addressed at a point where it may be too late to make changes without a significant cost or schedule impact".

POINT TO PROVE Throughout the interior, Galantowicz elaborates, "we started by having the designers understand the requirements through a series of demonstrations where they are the first people to install the product". Early in the development process the designer might fabricate a part out of cardboard with simulated fittings, "and they would demonstrate the ease with which that part would be installed. We then had the teams go through the design development phase, and we even involved our suppliers in that activity."

The simulation would be repeated at the pre-production stage. "Each time we set the highest of expectations for how quickly the design should be installed," continues Galantowicz. "One of the enablers was keeping in mind an end installation time that was significantly shorter than what we'd achieved in the past. We set a really high expectation knowing that that would help drive innovation in terms of how to make it easier. And then we have built on that all the way through, up until the final parts have been installed." Pre-production parts were also installed by production mechanics in a

validation vehicle: "Throughout the whole process we've tested the designs, we've improved them, we've tested the processes by which they get installed and we've improved those. We've even trained the people and used the feedback from every person involved in the process to make it quicker."

"It's not how you design the aircraft, but how you design the pieces that go into the aircraft so that they go in efficiently," adds Sullivan. "They use the production tools and they validate that the production tools all work, the jigs and the dollies to roll things in, and there are people with stopwatches checking every aspect of the installation. Some of our customers that have done retrofits with the same kind of seats have just stood there dumbfounded when they saw what we were doing on the 787 compared with what they do in retrofit. It's very exciting."

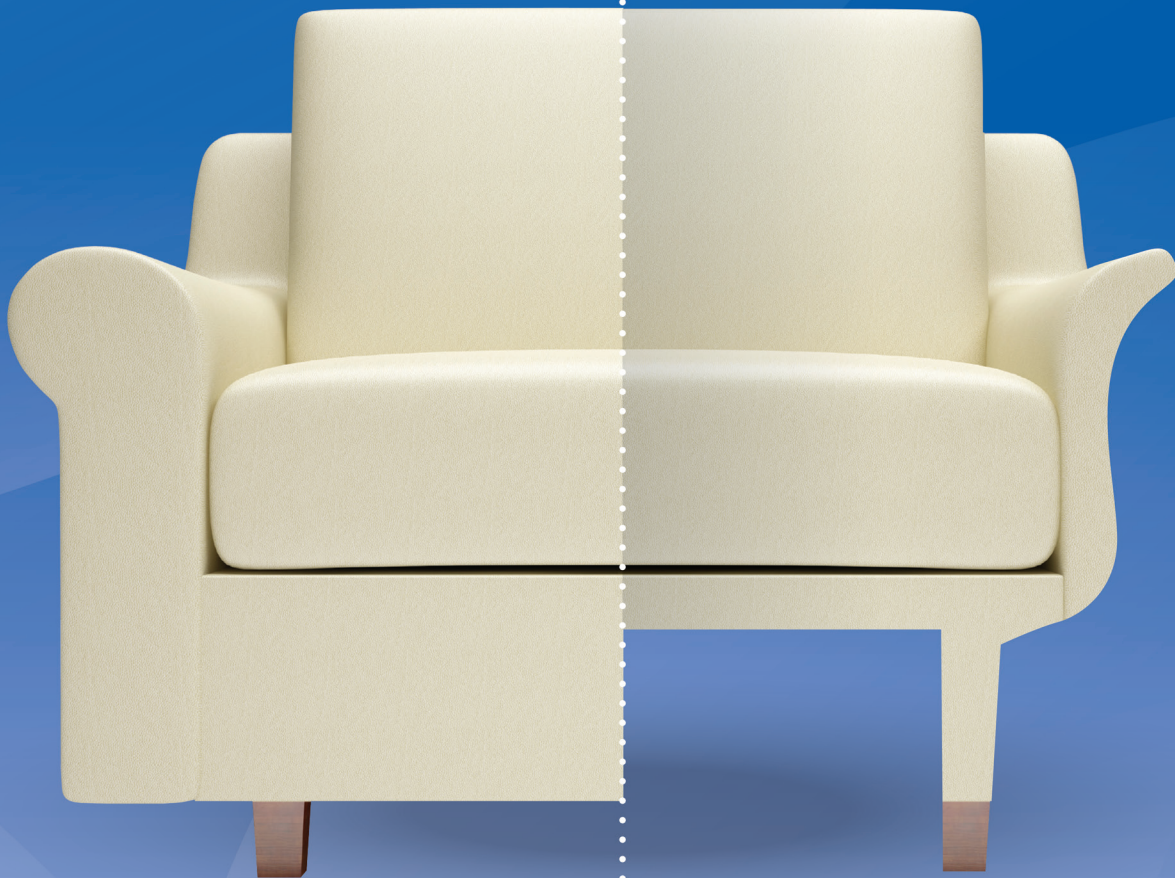
EARLY VERDICT Airline deliveries may still be months away, but flight test personnel have already validated the Dreamliner cabin's elevated comfort levels. "To a person, engineers who have been on test flights have remarked on the lower altitude and higher humidity levels in the cabin," says Sullivan. "Their ears don't pop even during dramatic changes in altitude. They said the lower cabin altitude and higher humidity level make them far less tired."

Less fatigue is not the only benefit, he adds: "My thinking is the coffee's going to taste better on a 787, because taste changes with altitude. And the babies are going to cry less. There's going to be some really magical aspects to being on a 787." ☒

CONTACTS

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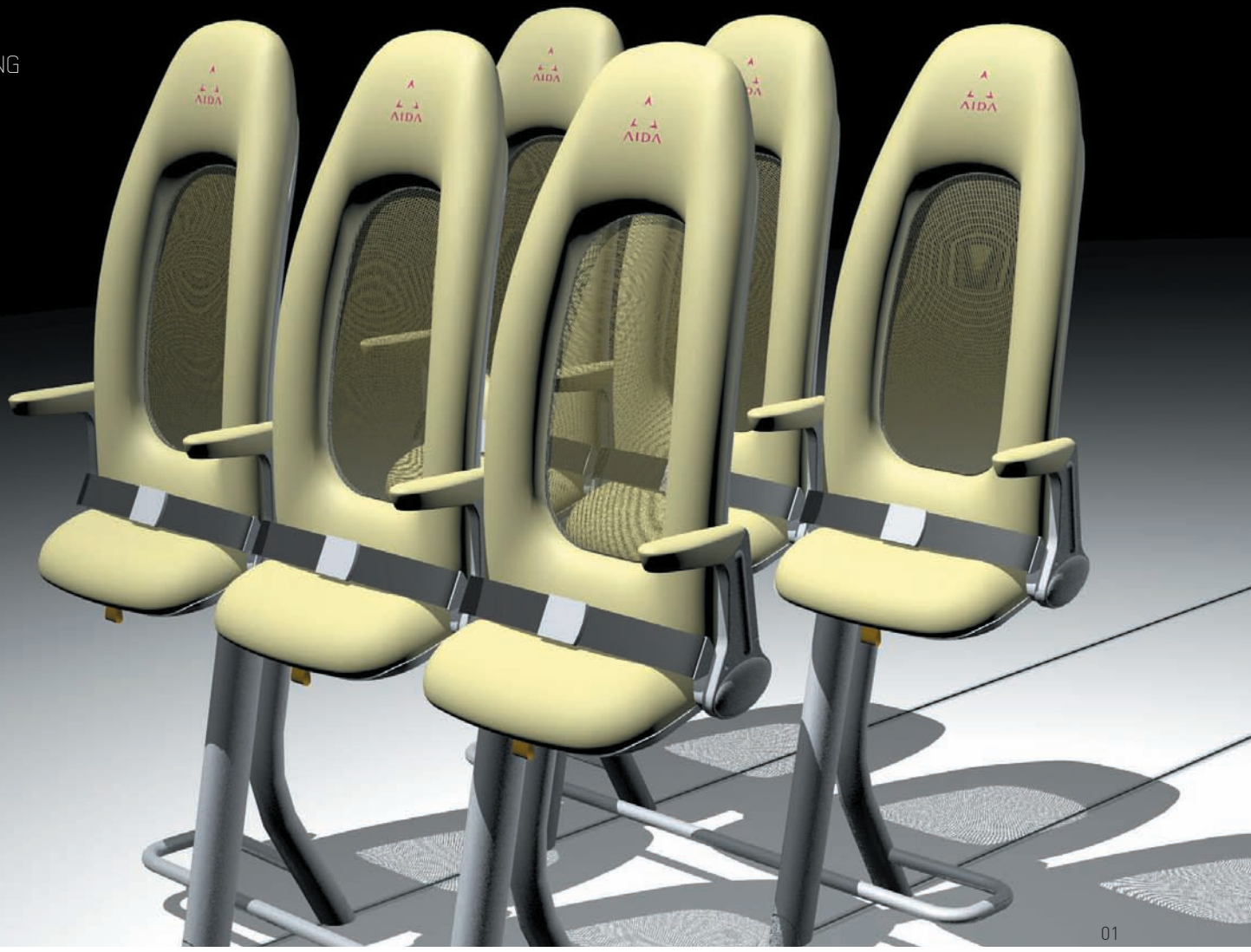
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01

space**race**

The attention surrounding the SkyRider seat that AvioInteriors showed at September's Aircraft Interiors Expo Americas prompts a closer look at an idea that refuses to go away

BERNARD FITZSIMONS, AIRCRAFT INTERIORS INTERNATIONAL

01. Aida's sit/stand seating concept was first presented in 2004

02. Rendering of AvioInteriors' SkyRider concept



"Boeing can put a man on the moon so I am sure they are able to make these a success," said Ryanair's head of communications Stephen McNamara in June, after his CEO, Michael O'Leary, had reiterated his ambition to introduce stand-up seats on short-haul flights.

Well, as the lawyers say, up to a point. Boeing, for a start, would be the first to acknowledge that it did have some help with the moon landings. But there is a more serious flaw to McNamara's argument: while it was and has remained firmly committed to space exploration, the aerospace giant has evinced no enthusiasm at all for stand-up seating.

Still, even Boeing can hardly ignore entirely an operator that has ordered more than 300 of its aircraft and the airline maintains that it is still talking to the manufacturer about the proposal, though a spokesman says a move to seek

regulatory approval for any resulting scheme is probably at least two years away. O'Leary, meanwhile, has developed the notion in a succession of interviews: the most recent proposal involves replacing the last 10 rows of seats and the two aft lavatories with 15 rows of upright supports, increasing capacity by 30 passengers.

REVERSE ENGINEERING A common response of online commentators to Ryanair's suggestion is to ridicule the idea by posting pictures of travellers spilling out of almost unfeasibly overcrowded trains in the developing world. But for China's Spring Airlines such pictures actually represent the reason for pursuing the standing seat idea.

Spring has barely a score of A320s compared with Ryanair's hundreds of 737s. But in Wang Zhenghua it has a chairman whose parsimony makes the famously cost-averse





THERE WOULD NEED TO BE MORE OR BIGGER DOORS AND SLIDES TO COPE WITH EVACUATION



03



04

- 03. SkyRider is designed for 23in pitch – or less
- 04. SkyRider is made from TIG welded chrome-molybdenum steel tube
- 05. Spring Airlines crew member demonstrates the airline's proposed 'half-standing' seat

O'Leary seem positively spendthrift: on a trip to London for a meeting with British Airways, for example, Zhenghua reportedly turned down the offer of a car on cost grounds and ended up hitching a ride to the airline's HQ on a crew bus instead. It is in a market whose potential for growth dwarfs anything to be found in Europe, with plans to operate 100 aircraft by 2015. And its ambitions for stand-up seating go far beyond adding a few extra rows.

Last year the airline outlined its scheme for a modified A320 – provisional designation A322 – that low-cost airlines could combine to order in numbers that the manufacturers would be unable to resist. The motive is to cut the cost of seats in order to offer what Spring describes as the 'grass-root people' of China – the 70% of the population that could never afford to fly on conventional aircraft – an affordable alternative to the overnight queues and 10-hour standing rail journeys that characterise the new year celebrations each spring.

As described by Spring's Zhang Wuan at the World Low Cost Airlines Congress, the A322 would have four rows of seats forward at 29.5in pitch but replace the remaining 26 rows with 39 rows of what it terms 'half-standing' seats at 20in pitch, raising capacity to 258 passengers. Spring's fares are already 36% below the industry average: the half-standing seats would enable it to cut them by a further 40%.

The aircraft would need increased power or reduced weight. Maximum payload of the existing aircraft is around

19,000kg, equivalent to 253 75kg passengers. But even a modest 7kg baggage allowance would reduce the number to 231, and with 15kg each only 211 could be accommodated. It would also need a redesigned cabin floor to cope with the increased weight.

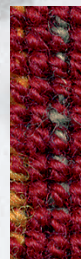
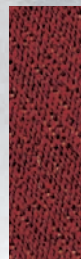
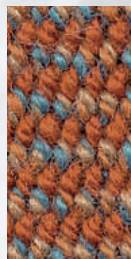
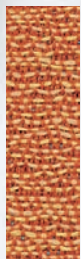
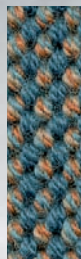
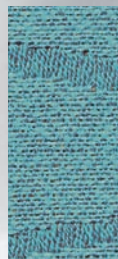
TALL ORDER The existing air conditioning system supplies 0.817kg/s of fresh air, which means it can support only 196 passengers and crew at the rate of 250 grams per minute required by Chinese regulations. There would need to be more or bigger doors and slides to cope with evacuation, more oxygen masks than the existing total of 210 (seven per row) and more fire extinguishers. Lowering the floor and raising the luggage bins could increase headroom, and passengers would be sorted at check-in so that short passengers occupied window seats with tall passengers next to the aisle.

Then there are the seats themselves, for which there are currently no regulations. Spring has three suggestions: a tip-up seat with a pan 150mm deep and 750mm above the floor that would allow the choice of sitting or standing; a leaning seat with a tilted 150mm pan and a back angled at nine degrees; and a standing-only seat, again angled at nine degrees. In each case the seat back is 1.75m tall, the top of the armrests is 800mm above the floor and passengers would wear dual over-the-shoulder adjustable elastic belts as well as conventional lap belts.



05

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passenger choice

While certification depends on the application of objective standards, passenger acceptance is a largely subjective matter. "If a passenger gets a short flight for less money and if there is not too much luggage, maybe the sit/stand seat would be an option," suggests AIDA Development's Heino Krueger.

Some trains already have sit/stand options, he points out, and rail commuters who spend their days sitting at work are generally happy to stand on the train home as long as they have something to lean on: "It's not so very far away to stand in an aircraft for 50 minutes, say a flight from Hamburg to Frankfurt."

Published research says he is right. An online poll conducted by Ryanair in July asked whether passengers would be prepared to stand for a one-hour flight if the fare was free or half that of a seated passenger. Of the 120,000-plus who voted, 66% said they would stand for free and 42% for half the seated fare.

Chinese web portal qq.com conducted its own poll last year with broadly similar results: 56% of the 30,000-plus respondents supported Spring Airlines' scheme for half standing tickets, and 54% said they would buy one.

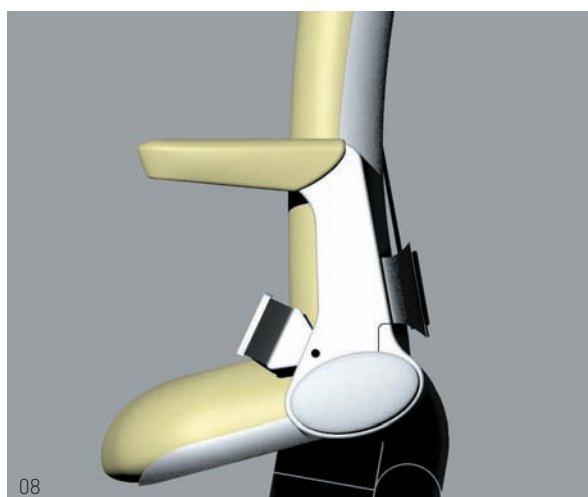
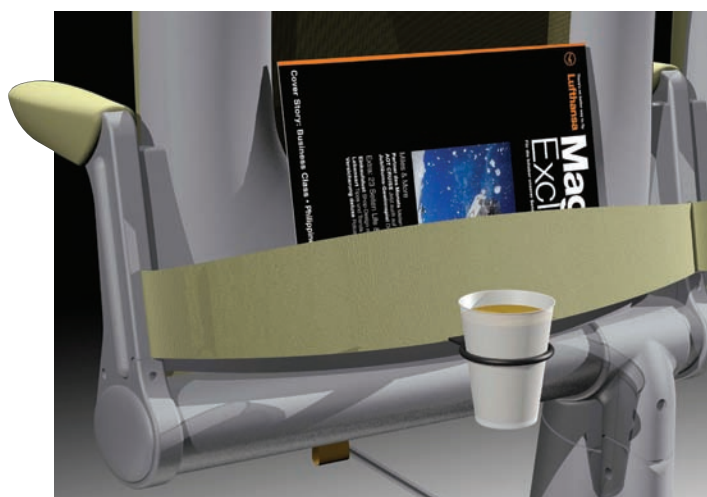
DEJA VU The standing seat idea has been around for some time, of course. Back in 2005 Germany's AIDA Development, which has done a lot of engineering work for Recaro Aircraft Seats and recently became part of major international engineering group SII, came up with a design for a sit/stand seat intended to accommodate passengers at high densities on short haul flights.

Applying composite materials to reduce weight, AIDA's design mounts three seats on a single horizontal main beam with an elliptical cross-section. Spreaders attached to the beam support the seat back, armrests and narrow, downward tilted seat pan. The spreaders also provide the anchor points for the seat belts, while cup holders and literature pockets are attached to the main beam. The beam itself is supported by two pairs of legs whose feet form a fore-and-aft oriented triangle to absorb energy in dynamic load situations.

The aim, the company says, was to support the passenger comfortably, whether seated or standing, throughout the

flight. An additional advantage cited was the increased opportunity for in-seat exercise. The project had posed many challenges, AIDA subsequently revealed, with safety requirements proving a particular headache for its designers and engineers. The sit/stand seat would have to be certified as a seat, so it would have to withstand forces equivalent to 16 times a passenger's weight. The small footprint meant high loads would be applied to a relatively small area of the cabin floor. And the seat would have to accommodate a wide range of passenger builds.

Even so, AIDA found, the concept was feasible and the benefits were compelling. Weight could be reduced by 20%, the company said last year, while the space saved would allow a 10% reduction in seat pitch. So airlines could cut costs while increasing revenues by carrying more passengers. The figures came in a press release calling for feedback from airlines about the concept's feasibility. So what happened next?



- 06. Aviointeriors likens SkyRider's comfort to being seated on a scooter
- 07. AIDA's concept includes an optional literature pocket and cup holder
- 08. Side view of AIDA concept



EVERY AIRCRAFT IS
CERTIFIED UP TO A
SPECIFIC NUMBER OF
PASSENGERS



10

09



09. Safety briefings can be built into the seatback

10. Triangular lower seat structure helps to absorb energy in dynamic load situations

"Nothing happened," says Heino Krueger, business unit manager in AIDA Development's Hamburg office, beyond further discussions. "We had interesting talks with airlines as well as railway companies, they were very interested to use the sit/stand seat for bistro cars, for example."

Certification remains the main challenge, says Krueger. "We have to certify the seats [to withstand] a dynamic crash load of 16g forward and 14g downward. So the seat has to be robust or stable enough to withstand the crash loads, and on the other hand the passenger has to survive. So the spinal loads and head impact criteria have to be fulfilled to get the seat certified."

Evacuation is another challenge, he points out: "Every aircraft is certified up to a specific number of passengers. Short-range jets have a limited number of doors, so this could be a challenge as well." Crowding in the aisles, he suggests, rather than the distance to the doors might be the main problem. Passenger services in the channel below the

stowage bins are a further challenge. "You have to carry enough oxygen systems," Krueger says, even if "you can probably forget about reading lights in this class."

AvioInteriors obviously knows all about the certification challenges and seems confident that they can be overcome. Its SkyRider, designed for a pitch of 23in or less, is a more mature engineering design than Spring's mock-ups, and the manufacturer has undertaken to develop certification plans with OEMs or applicants for supplemental type certificates, and to carry out the necessary testing in its own facilities. It compares the comfort level of the seat to that of a touring motor scooter rider, and says it is talking to potential customers in the United States as well as other regions.

Spring's conclusion is that its own more radical idea is feasible given a joint effort by manufacturers, component suppliers and regulators. Photos of its preliminary mock-ups suggest claustrophobia might be more of a problem than physical discomfort. But if the only alternative is standing for 10 hours on a packed train, an hour strapped to what amounts to a full height backrest might well seem an attractive option. ☒

CONTACTS

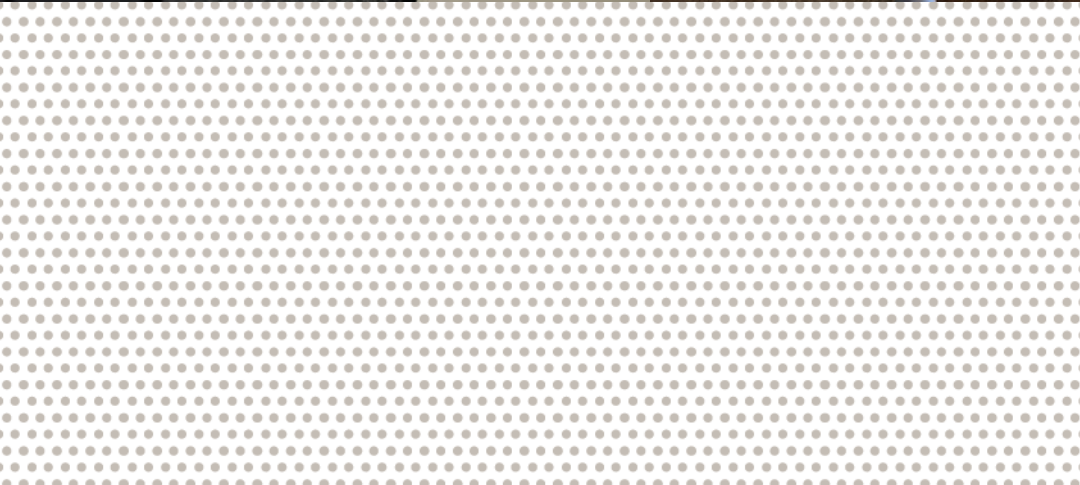
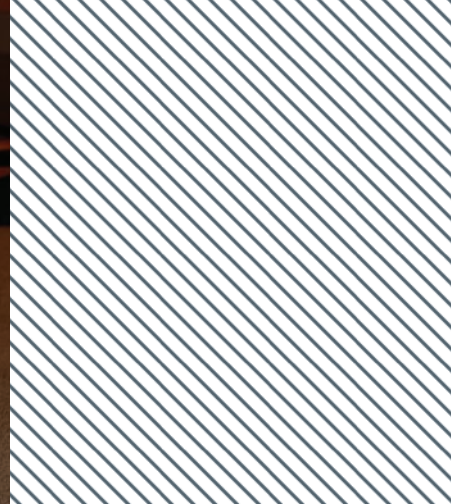
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Priestmangoode had just 12 months to develop a new brand identity and interiors for one of Europe's fastest-growing airlines

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Turkish Airlines is determined to position itself among Europe's elite carriers, investing in a new brand identity and new interiors to ensure it can compete with the likes of British Airways, Lufthansa and Air France. "Our mission is to become the preferred leading European air carrier with a global network of coverage, while maintaining our identity as the flag carrier of the Republic of Turkey," says Serdar Özer Öztürk, a brand consultant at the airline.

Turkish is already one of the fastest-growing airlines in Europe, operating a fleet of 149 aircraft and flying to 39

domestic and 128 international destinations, on five continents. Last year it carried 25.1 million passengers – a 20% increase on the previous year. With a further 105 new aircraft on order, the airline has every confidence in its phenomenal continued growth.

It is also clearly in a hurry to reach the top – just ask Luke Hawes at Priestmangoode, the London-based design studio charged with rebranding the airline, including the development of a new cabin scheme for the entire Turkish fleet. "We were first introduced to the airline on Lantal's stand at last year's Aircraft Interiors Expo in Hamburg in

action replay

Turkish Airlines' new cabin is being promoted via a television ad featuring players from Manchester United, which the airline sponsors. "We worked with Bowes Fastrac to build a mock-up of the A330 and deliver it to Manchester for filming – and we had just 10 days to do it in," explains Priestmangoode's Luke Hawes. "I still don't know how they did it, but Turkish managed to get the third shipset of seats from Contour. They were delivered to the production company for the shoot and then on to Airbus. The guys from Turkish had to sign it off from Contour and then take responsibility for them during filming. The end result is fantastic and it just goes to show how great our industry is at doing things."



01

02

May,” explains Hawes. “We then entered a four-way pitch before presenting our ideas in Istanbul in June last year and being appointed the following month.”

With the fruits of his labour already evident – the airline received the first of 12 777-300ERs it has on order from Boeing complete with new interior in October 2010 – Hawes describes the project as having “an aggressive timeline”. An inflight product development scheme would normally take anywhere from 18 months to three years. “The initial brief was for its new 777s and A330s and it was literally a 12-month programme,” says Hawes.

However, Turkish had already decided on its seat vendors – Contour for business, Recaro for premium-economy and Weber for economy – with hard design details frozen by the time Priestmangoode came on board.

“The brief was to take off-the-shelf seat products and apply our trim and finish, as well as to design custom panels where we could,” explains Hawes. “The airline had already chosen Contour’s Aura seat for business class, for example. Because of the timeline, Contour was quite strict about not changing the seat architecture too much, so it was more about the overall trim and finish – and that was the case for all the seating classes. We also designed monuments, customised sidewalls and specially branded fore- and aft-facing cabin bulkheads.”

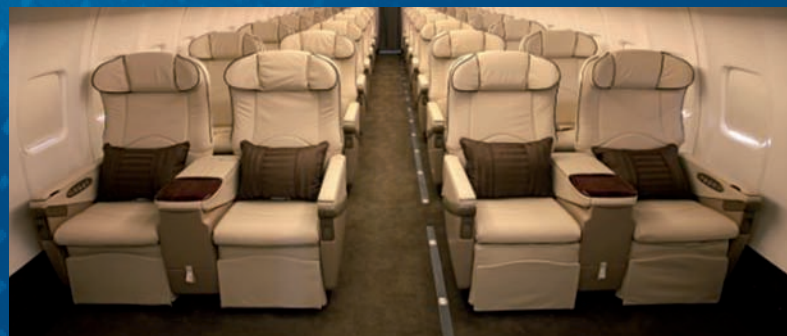
The end result will be installed in all 105 aircraft that Turkish Airlines has on order and will be retrofitted across its existing Airbus and Boeing fleets. The project also included consulting on logo and livery design and translating the new cabin designs to ground services to create a consistent design language from check-in to destination.

CONTINENTS COLLIDE “The goal was to move Turkish Airlines from being a rather unknown carrier – by that I mean people couldn’t categorise whether it is Asian or European or a cross between the two – it was very difficult to place it,” explains Hawes.

- 01. Business class features Contour’s Aura seating units
- 02. Backlit 3D domed logo – a key rebranding feature

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03



04

“It was also important to create brand values that reflected Turkish heritage and its people’s traditional hospitality,” adds Öztürk.

To get a better feel for the country, the Priestmangoode team spent about a week in Istanbul, visiting mosques and museums and looking at examples of its architecture, art and design.

“The tulip is Turkey’s national icon and that comes through a lot in their textiles and ceramics,” says Hawes. “Then you’ve got these splashes of really bright colour in the mosaic tiles used throughout the mosques and other buildings. That was really quite inspiring and gave us the seeds for a lot of our ideas.”

Meanwhile, the airline was not slow in coming forward with its own ideas.

“The in-house Turkish marketing and design team are quite hands on,” continues Hawes. “If they saw something they liked – an old piece of furniture, a pattern or something – they’d send through a photo and say ‘have a look at that, now that’s very Turkish, that’s a symbol and that represents what we do and who we are’, so that helped.”

COLOUR CODE Hawes says the resulting cabin scheme clearly modernises the airline while retaining its Turkish national identity.

“From a myriad of colours to textile design, pattern design and ceramics, we used the rich and colourful heritage of Turkish culture, and Istanbul in particular, to create a contemporary design language to apply across the airline’s services, starting with a fully customised trim and finish for the cabin interiors,” he says.

Features of the rebrand include a back-illuminated 3D domed logo badge that greets passengers in the galleys, as well as on the back wall of every cabin. The new logo is presented on a black pearl pattern – inspired by traditional

supply and demand

Turkish Airlines’ new cabin is bursting with colour – which means its warehouses back on the ground are positively bursting with spares, because of the high part numbers involved. “Turkish has a great attitude – if the design is right then it will do it and it’s got a system in place for handling all the part numbers and inventory,” says Luke Hawes of Priestmangoode, which helped to design the interior. To give an example, the new business-class seat trim and finish specification lists more than 60 different part numbers, while the new A330 cabin spec features 13 customised foils for sidewalls and other panels. And that’s before you consider the nine different seating colours in economy!

Turkish mosaic design – on the business-class back wall, along with a back-illuminated red branding strip with the Turkish Airlines text. On either side are curtains from Lantal with a laser-cut tulip pattern – the first time this technology has been used on board an aircraft.

The business-class cabin features grey tulip-patterned seats with an embossed Turkish Airlines logo on leather headrests. The Turkish Airlines red branded colour is used as a reveal between the headrest and the seat and on the seatbelts. Business class provides a total of 28 seats on the carrier’s new 777-300ERs, in a 2-3-2 configuration at 78in pitch.

Comfort class, the carrier’s branded premium-economy offering, is found on all its Boeing aircraft. It offers 19.3in-wide fixed-shell seats at 45in pitch in a 2-3-2 layout, with 10.6in IFE screens deployed from the armrests providing entertainment. Earthy tones of green, brown and grey dominate, with brown textile seats with embroidered green stitching and reveal details between the seatback and

03. Business-class headrest detail

04. Comfort class (premium economy) features 45in seat pitch

05. Some of the decorative foils developed for Turkish Airlines' A330s



WE WANTED TO USE COLOUR IN A BIG, BIG WAY – TO MAKE REAL STATEMENTS WITH BRIGHT, BOLD COLOURS

headrest. The back wall of the cabin uses a leaf pattern on a green background.

Turkish is installing 246 economy seats on the 777-300ERs at 31in pitch in a nine-abreast configuration. They feature nine colours, reflecting the visual richness found in Istanbul. The back wall bears a white pearl design inspired by traditional Turkish mosaic patterns with the 3D domed back-lit logo and laser-cut tulip patterned curtains on either side.

“In particular we wanted to use colour in a big, big way – to make real statements with bright, bold colours – but to use them on smaller surfaces,” explains Hawes. “The economy headrests are a good example, where we’re using nine different headrest colours. That for me is the middle of Istanbul – when you go round the markets – it’s all like that. We also used the red Turkish Airlines brand colour throughout to accentuate the brand presence.”

For the future, Öztürk says the airline is also looking to introduce the latest connectivity solutions. “For our new wide-body fleet, we are working on the connectivity project, which we plan to implement in the second quarter of 2011,” he says. “The features of our new product will be WiFi connectivity, Live TV and GSM applications.”

TIME TRAVEL With only a year from concept to delivery, the project was reliant on an efficient chain of command: “Because the timeline was so aggressive, it helped us to get decisions made,” says Hawes. “We worked very, very quickly with the vendors, with Lantal in particular, to

develop full-size samples that we threw over the chairman’s chair. We did give him a few options – tonal differences, scale of pattern – but we pretty much said, ‘we think you need to do that’.”

The schedule also forced the airline and design studio to adopt a practical approach throughout, making the most of existing technology.

“It’s quite tough because both Airbus and Boeing have different lights certified and qualified so we couldn’t use the same solution for both,” says Hawes, referring to the backlit 3D logos on the bulkheads. “It was actually very difficult because of the timescale; there was no time to certify a new light source, so we had to basically look at their existing catalogue and see what could do the job. We found out what the tightest band radius was, as this would determine the size of the logo. So we were literally bending the light as tight as we could around the logo to light it.”

FULL PACKAGE Turkish Airlines is now working on a complete rebrand to help it achieve its goal of doubling its number of weekly flights by 2015, with a focus on increasing transatlantic long-haul route frequency to North, Central and South America, as well as major Asian and African destinations.

“With its main hub in Istanbul, Turkish Airlines is uniquely positioned to become a global airline serving both the Eastern and Western hemispheres,” says Öztürk.

“The interiors will act as the introduction of the new brand and then you’ll see it roll through ground services and the rest of the fleet,” adds Hawes. “Some of the patterns and designs we’ve generated could work with the cabin literature, for example, or soft furnishings for the lounge or onboard accessories. The cabin gives us a good guide to work with.” ☒

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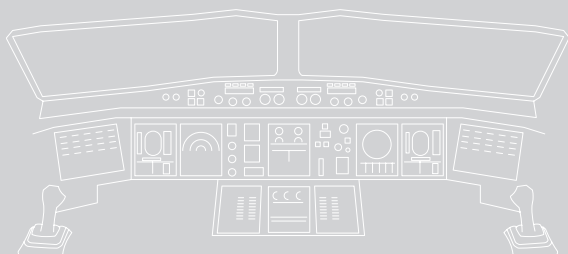
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The fallout from Koito's admission that it has falsified seat testing data continues, with airlines asked to inspect and possibly remove seats currently in service

CHRISTINE NEGRONI, AIRCRAFT INTERIORS INTERNATIONAL

 The Japan Civil Aeronautics Board (JCAB) called it treachery; the Federal Aviation Administration (FAA) said it was "not like anything we have observed before". Thai Airways has filed a lawsuit over it, but Koito Industries, the company accused of lying about the safety of its aircraft seats, is keeping quiet for the moment.

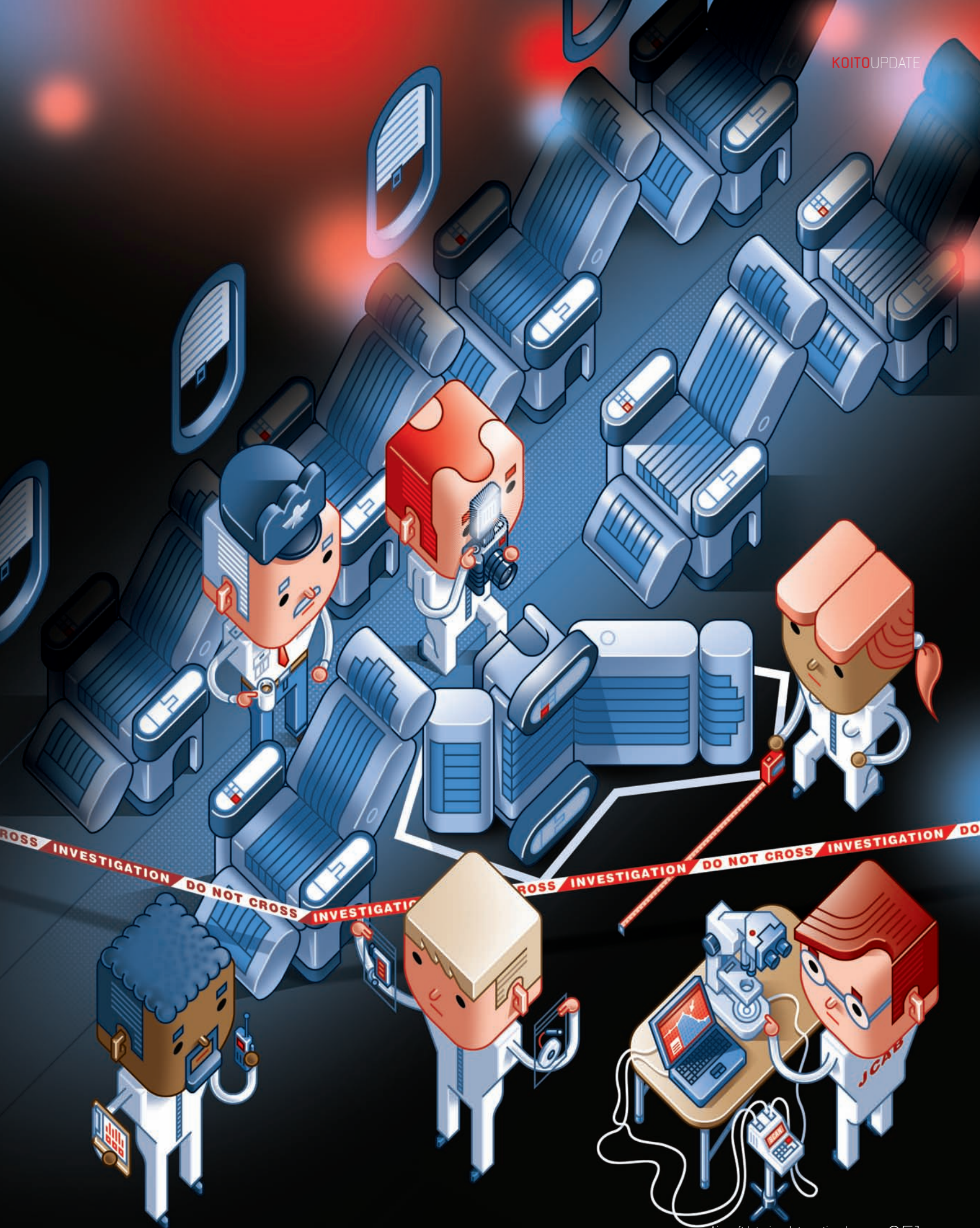
This is not to say that it is business as usual at the Yokohama-based seat manufacturer. Though it repeatedly declined requests to answer questions for *Aircraft Interiors International*, sources familiar with the company say Koito is working hard to regain its reputation as a reliable seating supplier to the airline industry.

In the meantime its clients – 34 airlines from nearly as many different countries – just got news that US and European regulators have each proposed an Airworthiness Directive (AD) that would require airlines to inspect and possibly remove as many as 150,000 Koito seats already installed. "We are focusing our resources on removing the suspect seats through implementation of the AD," says Les

Dorr, a spokesman for the FAA. "We believe that the situation must be corrected."

The European Aviation Safety Agency directive goes a step beyond the FAA's, requiring that even if the seats pass inspection they must be removed from service after 10 years. "We consider the seats, the air worthiness of the seats by Koito as questionable," says Dominique Fouda, safety information and communications officer with EASA. "There is still a risk of non-compliance," he says.

INSIDER INFORMATION Koito's abrupt fall from grace began in the summer of 2009, according to the Civil Aviation Bureau of Japan, when the agency received an email from a Koito supplier. "He was anxious," remembers Takayuki Sakai, an airworthiness engineer at the JCAB, explaining the whistleblower's motivation. The seats Koito was building were not in compliance with international standards, the informant said. When the claim was confirmed by a second person with inside information and inspections by the JCAB, the agency asked Koito to conduct





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its own investigation. "About one week after we ordered the investigation at Koito, and Koito investigated inside the company they told us, 'the information is true'," continues Sakai. Shortly after that, the JCAB rescinded the company's production approval.

By February 2010, the then-president of Koito, Takashi Kakegawa told reporters at a news conference in Tokyo that "the entire organisation was involved". The fraud was on a monumental scale.

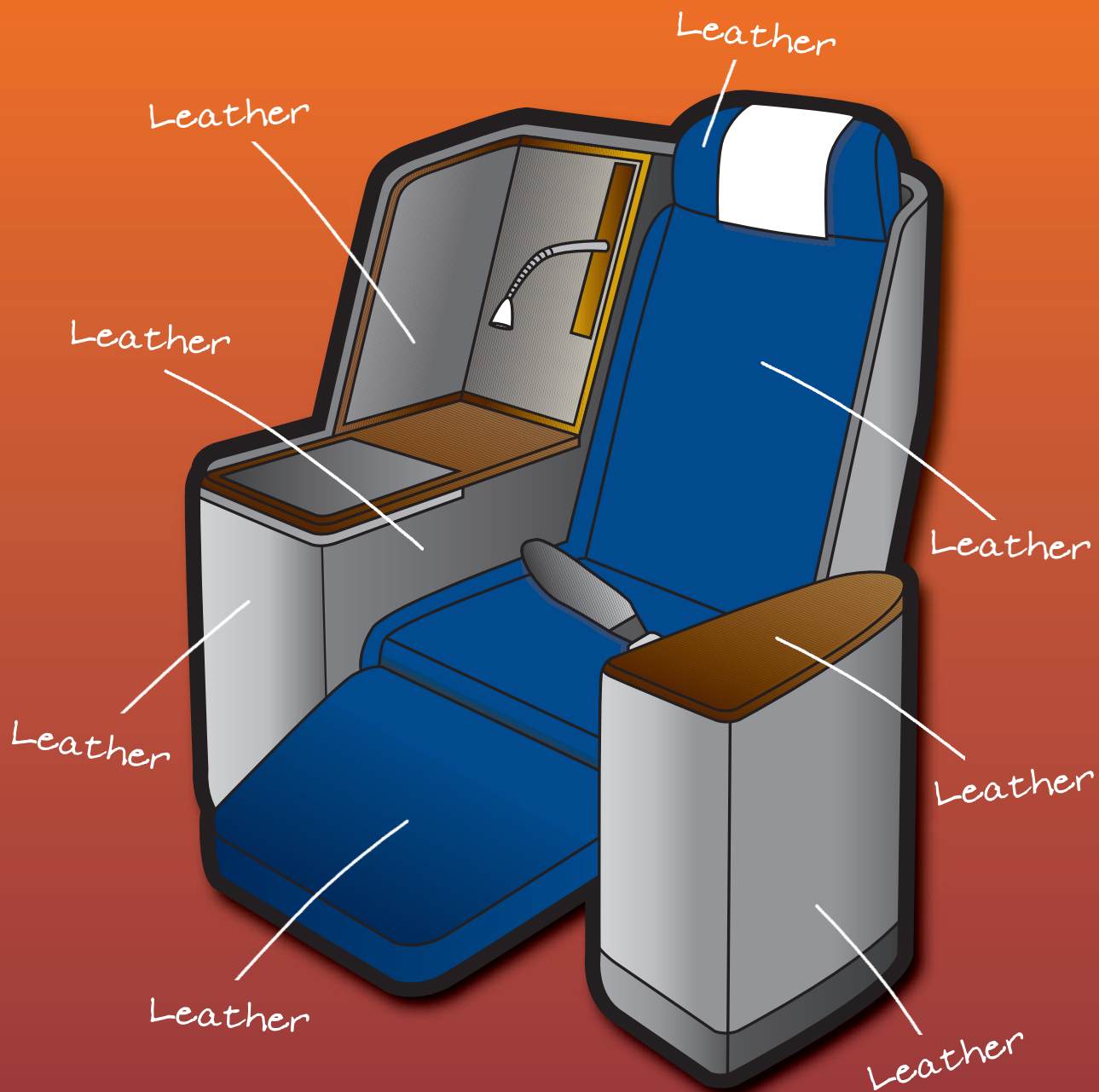
LATE DELIVERY This was news to reporters, but carriers such as Continental Airlines were already feeling the enormous scope of the problem. The loss of Koito's production approval suspended all installation of Koito seats. In Renton, Washington, USA, Boeing was putting the finishing touches on nine Boeing 737s and two 777s

purchased by Continental. Seen from the tarmac where they languished through the spring and summer of 2010, they looked complete but inside there was nowhere to sit. "The planes were in limbo," says a Boeing employee familiar with the situation who asked not to be identified. "You can't deliver an aircraft without certified parts and Koito's seats were not certified. They were stuck." Eager to deliver the aircraft and get paid, Boeing assigned a special team to redesign the passenger cabins and find new seats, the source says.

"When we receive the aircraft, they will have B/E Aerospace seats," said Mary Clark, a Continental spokeswoman when asked in June about the delay. By October, Clark said the airline had received 11 of the new aircraft and expected two more by the end of the year.

Boeing had a similar problem with a 777 destined for Japan Airlines and Airbus was unable to deliver a new A380 to Singapore Airlines and five A330s to Thai Airways.

But the majority of Koito's customers have a different problem – the seats are already installed and in service. The European and US directives both mandate that all Koito seats be tested to see if they comply with standards including the new 16g dynamic test. Seats that fail must be removed. "We've been working closely with the FAA and Boeing over the past year in anticipation of the rule," says Continental's Clark, "and have completed preliminary testing on seat models on the majority of our aircraft."



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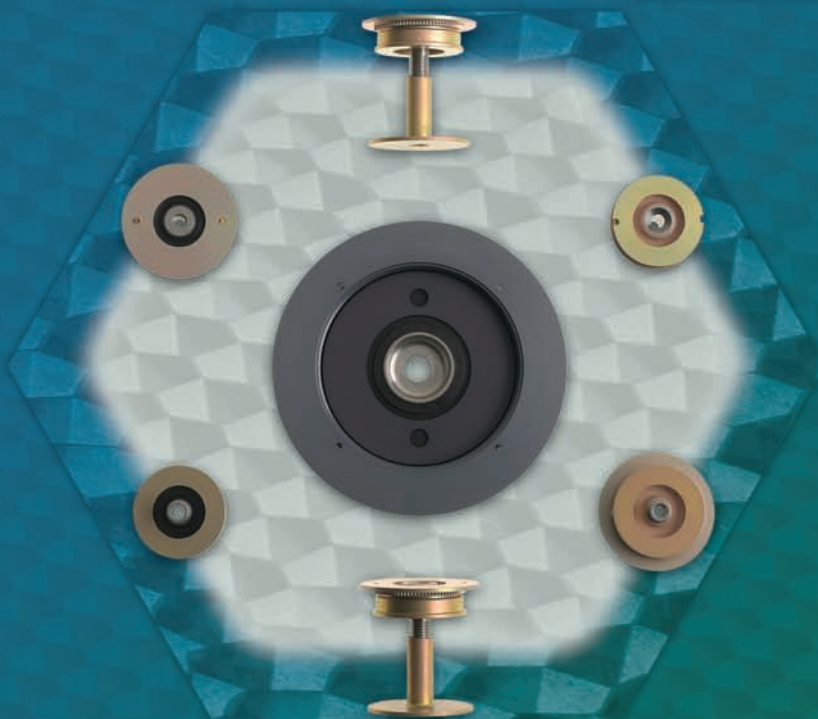
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direct action

EASA and the FAA have each proposed an Airworthiness Directive (AD) that would apply to airlines currently flying Koito's seats. "The Japanese airworthiness authority JCAB has informed EASA that a review of the safety of passenger seats manufactured by Koito industries has disclosed discrepancies that include falsification of static, dynamic and flammability testing, as well as uncontrolled changes to production data (material and dimensional)," said EASA in its proposed AD, which closes for consultation on 17 November.

The FAA has issued a Notice of Proposed Rule Making (NPRM) calling for additional testing and possible removal of Koito seats following the JCAB's own investigation. However operators can demonstrate compliance if they can show that their seats match new seats produced by Koito and tested under the supervision of the JCAB during its investigation.

TESTING TIMES Both the FAA and EASA say that since Koito falsified test results, there is no way of knowing if their seats have the strength, durability and flame resistance to protect occupants in the event of a crash or other catastrophe. After the scandal broke in 2009, the JCAB supervised a first phase of inspections and testing that ended in May. JCAB's Sakai says seats demonstrated a variety of weaknesses. Some failed dynamic tests while others failed to provide adequate head-injury protection. Seat fabrics and cushions in some cases were not adequately flame retardant.

Koito's duplicity may go back to the mid-1990s, but the most intense attention has been focused on the years between 2003 and 2008. In a letter to the FAA, Shigeru Takano director of airworthiness at the JCAB said it was during this busy time that Koito "might have conformity-related problems including falsified inspection records, due to schedule pressure."

WHAT WENT WRONG? Others agree that Koito may have been overwhelmed: "They make good seats and they were always reliable on deliveries and Boeing was pleased to work with them," says a source familiar with Koito who asked not to be identified. "Maybe the pace of those deliveries caused them to become compromised."

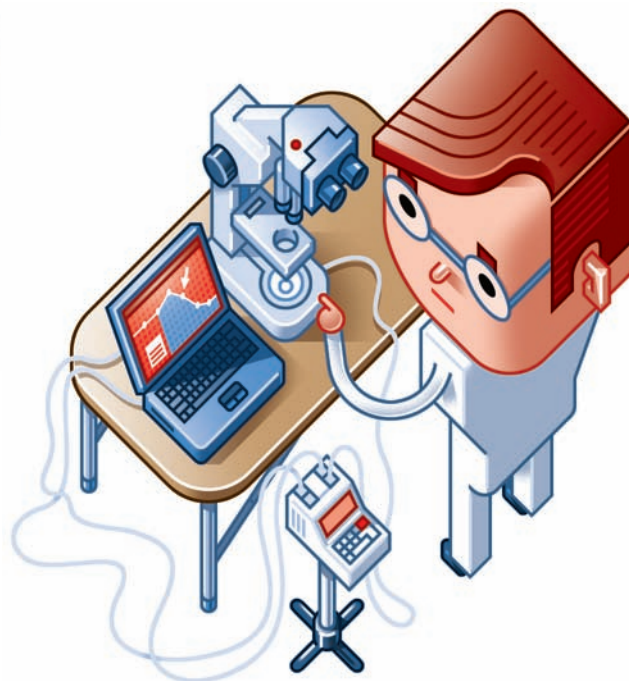
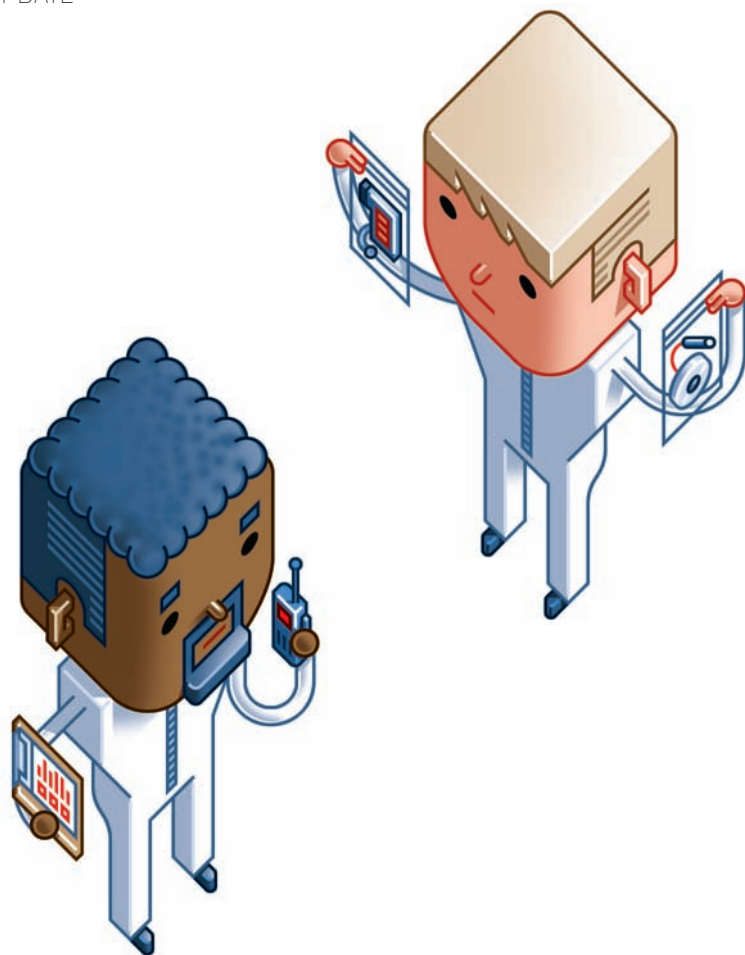
According to the seat manufacturer's website, Koito was ranked as one of Boeing's top suppliers some five times from 1991 until 2002. It even received the Boeing President's Award in 1996. In light of recent events however, many people are wondering how this seemingly successful producer of a valued product went so far off the tracks, and why regulators were clueless for so long.

"Who was watching them that they could get away with this," asked one source at a carrier that purchased Koito seats. "The aircraft manufacturers, the regulatory agencies the upstream suppliers, how could Koito get away with this?"

"You always have to have a balance between too many requirements and not enough," says Vincent De Vroey, general manager technical and operations for the Association of European Airlines (AEA), an airline trade organisation that has three members using Koito seats. "Airlines also have quality control systems to prevent things going wrong, and the same should apply to authorities."

David Esse is a sled-facility test engineer for the international engineering firm MGA Research Corporation. "I don't get the sense people are trying to rush things through," he says when asked if certification testing creates extraordinary burdens for manufacturers. "People are taking the time to get things through. As a test lab we take the time we need to do it right."

INVESTIGATION DO NOT CROSS INVESTIGATION DO NOT CROSS INVESTIGATION DO NOT CROSS INVESTIGATION DO NOT CROSS



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Esse notes that during actual certification tests he usually sees a representative present from a regulatory agency, the FAA or EASA. But EASAs Fouda says government officials are not always present at every part of the certification process: "Throughout the stages of manufacturing a product there are several steps, and through the different steps the production organisation approval enables them to perform a certain number of tasks and the testings. It's a long process and the results of every step are analysed by the regulator."

The JCAB declined to answer questions about how it supervised the certification at Koito prior to the scandal, but it was "in the front position" according to Fouda.

Meanwhile, responsibility and compensation will continue to be discussed, especially when lawsuits filed by Thai Airways and others go to court. Airlines will claim the costs of testing and seat replacement, as well as loss of revenue for seats and aircraft that had to be taken out of service.

In a financial filing, Koito Manufacturing, the parent company of Koito Industries, reported it had set aside ¥3.6 billion (US\$448 million) for payment of damages. With 150,000 seats affected and the cost of each seat ranging from US\$5,000 to US\$100,000 – it may not be enough.

"Airlines have to take seats out of airplanes," says Vroey. "If you take seats off, you can't sell the seats. Several airlines

will have to ground aircraft just for testing. And if they fail certain tests, to do the modifications in two years will be impossible. Procuring new seats is not a process you can do overnight."

De Vroey says Koito has been uncommunicative and that airlines are hoping the aircraft manufacturers will help even though seats are buyer-furnished equipment. "The contract for the supply and support of the seats is directly between the airline and Koito," says Mary Anne Greczyn, manager of communications for Airbus America.

Still, this autumn, Airbus and Boeing participated with the airlines in planning strategies for handling the unprecedented crisis. The manufacturers see the value in not only holding the hands of their airline customers, but their supplier's hand as well. "Boeing currently has a team on-site in Japan assisting Koito with its quality management and production systems," says Beverly Holland, a communication specialist with Boeing. "We are supporting Koito's efforts to review seats in the assembly process as well as in-service." ☒

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A photograph of the interior of an ATR 600 aircraft, showing rows of red leather seats with white armrests. The cabin features a sculpted ceiling with integrated lighting and overhead storage bins. The overall design is modern and minimalist.

ATR600ARMONIA

artisticlicence

Slimline seating and sculpted ceiling, side panels and overhead bins help lighten the mood on the new ATR 600 Armonia interior, with design input from Giugiaro

MATT CONDER, AIRCRAFT INTERIORS INTERNATIONAL



Headquartered in Toulouse, France, ATR is an established force in the regional turboprop sector, having sold more than 1,000 ATR 42 and ATR 72 aircraft to over 150 operators in more than 80 countries. “Every 20 seconds, an ATR aircraft takes off somewhere in the world,” proclaims the company’s website. The aircraft manufacturer hopes to further tighten its grip on the sector in the second half of 2011 when the new ATR 600 Series aircraft, which features a 2.26m-wide cabin described by ATR as the “widest in the turboprop market”, makes its formal entry into service.

First announced in 2007, the new ATR 42-600 and ATR 72-600 aircraft have been designed to offer three key improvements over the 500 series: better performance through their new short runway take-off ability; better technology via a new avionics suite; and improved passenger comfort courtesy of a new Armonia interior. So far customers include Kingfisher Airlines, Caribbean Airlines and Air Tahiti. First deliveries are expected next summer with catalogue prices for the ATR 42-600 and ATR 72-600 at US\$18.4 million and US\$22.1 million respectively.

ITALIAN INFLUENCE ATR has partnered with Giugiaro Design to inject some Italian flair into the new 600 Series interior – its ‘Armonia’ name hopes to conjure associations with beauty, harmony, balance and calm. Giugiaro has over four decades of design experience across high-profile projects involving cars, ships, trains and aircraft. “We decided to partner with Giugiaro because of their prestige and their enormous knowledge and experience in design,” explains Pierre Tiefenbach, ATR’s customisation director.

With regard to the design brief, Tiefenbach says the unique requirements of a regional turboprop played a major part: “The aircraft needs to be easily and rapidly maintained,” he explains. “When we started thinking about the main development goals, we clearly had in mind to maintain at least the same level of accessibility to the structure that we have in our current cabin.”

With this goal in mind, the overhead bins have been redesigned to enable easier maintenance – engineers simply remove four quick-release pins to disassemble a 93in bin and access the aircraft structure behind. “But of course we

“

WHILE OFFERING GREAT COMFORT AND LOOKS, THE CLASSIC SEAT REMAINS AT 9KG PER PASSENGER ”

”



02



also had to take weight, vibration and noise into account in our developments,” continues Tiefenbach. “It’s a real challenge to make the interior look spacious and clear, while offering the same level of service and equipment as on larger aircraft.”

Although the typical flight time for an ATR aircraft is only around an hour, Tiefenbach says no effort has been spared in improving the cabin: “The possibilities to make the flying experience remarkable on an ATR are numerous,” he says. “Even though the flight time is rather short, passengers can still expect a very high level of service, with IFE, warm meals and hot coffee.”

SEATING OPTIONS Particular attention has been paid to cabin seating, which has been designed to ensure greater knee clearance and more personal space – along with increased under-seat capacity. An optional two-class configuration includes a first-class offering upfront with wider seats (in a 2+1 layout), more legroom, large armrest tables and a window for each row.

Napoli-based Geven Aircraft Seating and Interiors is manufacturing three types of seating exclusively for ATR. Tiefenbach says the seats have 30% fewer parts, reducing weight and improving maintainability. Operators can choose between Classic; Prestige; and First Class. The Classic seat features a 29-31in pitch and short armrest with seat cushion



03

customer update

Caribbean Airlines is the latest customer for the new Armonia cabin, after ordering nine ATR 72-600 aircraft at a cost of US\$200 million at the end of September. The aircraft will be configured with 68 seats and equipped with the new ATR-600 series avionics suite. Deliveries are scheduled to start in late 2011. The new aircraft will replace Caribbean Airlines' current fleet of five Dash-8 300s, while adding new frequencies linking Trinidad and Tobago and surrounding destinations. In addition, several of the new ATRs will be operated on the route network of Air Jamaica, recently acquired by Caribbean Airlines.

width at 17in. Prestige has the same pitch and width but offers a 4in recline function, upper folding tablet, coat hook and a cup holder. Both Classic and Prestige seating is four abreast. First Class is wider with a seat cushion width of 19in, and features 35in pitch and large armrest tables.

"For Classic and Prestige seats, the seating capacity remains the same as current ATR 42 and ATR 72 models – 50 passengers for ATR 42 and 74 for ATR 72," says Tiefenbach. "The minimum pitch on ATR is 29in for Classic and Prestige seats. We will have the possibility to install Classic and Prestige seats in the same cabin," he continues.

"For the First Class seat, we propose two or three rows, but the customer can decide to have more. The pitch we propose is 35in as this is a good compromise between comfort and the number of passengers in economy class. The two classes will be separate with a class divider. This same class divider can be installed with classic and prestige seats, without visible fittings."

REDUCED WEIGHT Using new lightweight materials throughout the interior has led to a reduction in total weight by the equivalent of two passengers. "We worked with Geven on reducing the weight of foams; we also opted for a high grade aluminium to further reduce weight, and we looked to remove any superfluous features," explains Tiefenbach. For example, the Classic seat's backrests are

made of carbon fibre, the armrests have been redesigned to be shorter, the recline actuator has been removed altogether and the backrest height has been lowered. "This is why, while offering great comfort and looks, the Classic seat remains at 9kg per passenger," says Tiefenbach.

The same critical weight analysis has been applied to other cabin components. For example the structure supporting the PSUs has been integrated into the overhead bins – reducing parts and the overall weight of the whole assembly. The new LED lighting system also weighs considerably less than the previous system and is more energy efficient. Tiefenbach says ATR continues to explore new possibilities for weight reduction in the cabin, including the use of new lightweight leathers.

BAGS OF ROOM Another important goal was to offer passengers more storage capacity. Tiefenbach says customers on regional routes expect to carry a large volume of luggage in the cabin to avoid wasting time at the airport. "Today many passengers want to carry-on their roller bags and this is why the dimensions of the overhead bins have been re-invented in order to fit more bags of this type," he says. "On previous configurations 40% of passengers could store their bag overhead; today 70% of passengers can store their 25 x 42 x 55cm roller bags in the overhead bin. We designed the overhead compartment around a typical roller bag. This

- 01. Cabin overview
- 02. Prestige economy seat
- 03. Turboprops fulfil an important role on regional routes

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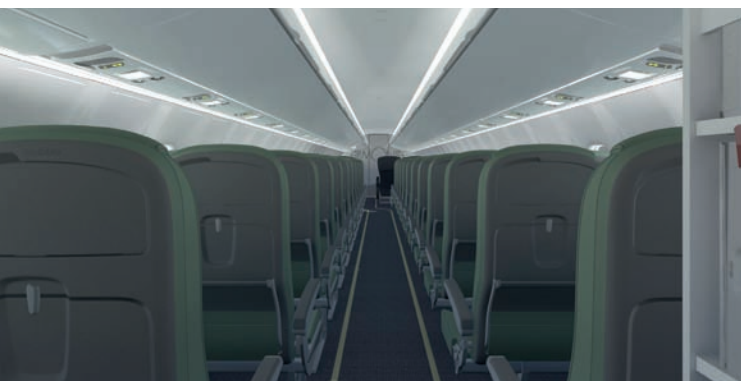
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04



05

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ALL THE DESIGN WORK APPLIED
ON THE SEATS, FOR EXAMPLE,
HAD AN AUTOMOTIVE DESIGN
PHILOSOPHY”

design icon

Based in Turin, Italy, Italdesign-Giugiaro has designed some of the world's most iconic automobiles. More than 100 research prototypes, 200 mass production vehicles and about 50 million cars on the world's roads first took shape at the design house. Some of its best-known work includes designs for Maserati (including the Boomerang concept car pictured below), Alfa Romeo and BMW Mini. Its creations are often featured in movies – it designed the De Lorean DMC 12 that went on to be featured in *Back to the Future*; and it was also responsible for the sleek lines of the Lotus Esprit – made famous in *The Spy Who Loved Me*.

The industrial and transport design division was established in 1981, and the company has since worked on projects for ships, trams and high-speed trains. But it's also tackled corporate identity, graphics, packaging and food design projects. Clients include Apple, Nikon, Swatch and L'Oréal, with the studio designing cameras, office chairs, kitchens and Indesit washing machines, as well as a basketball used at the Beijing Olympic Games in 2008.



06

was achieved by adapting the shape, length and opening size of the new overhead bins to these dimensions.”

Giugiaro and ATR have also come up with some innovative ways to improve the sense of space and calm for passengers, starting with a new LED lighting system, with a dimmer function and a blue colour option. The lighting works in harmony with an overall cabin colour and trim scheme designed around a sense of calm.

Tiefenbach says strong emphasis has been placed on the need for each passenger to have their own personal 'living space' in the cabin and to create a feeling of light and space. He cites the design of the overhead bin doors as an example. The doors have been designed so that instead of opening out over the passenger's head and covering the lighting above them, they slide away behind the furnishing. Thus enabling the space above where the passenger is seated to be clear – maintaining a constant space from floor to ceiling.

DESIGN DRIVE The clean lines, plush panelling and stylish seats of the new cabin have been inspired by modern sports car styling, according to Giugiaro: “This was never far from our minds,” admits Fabrizio Giugiaro, co-chairman and styling director. “In the ATR Armonia cabin project, all the design work applied on the seats, for example, had an automotive design philosophy. You can perceive it especially in the cushion partitions and stitches. But some aspects have

- 04. Economy cabin features 2+2 seating layout
- 05. First Class seat unit
- 06. Maserati Boomerang concept car

- 07. Redesigned overhead bins provide space for more roller bags
- 08. Two-class configuration



07



08

key features

- Wider, lightweight seats are ergonomically designed to ensure greater knee clearance, an enhanced sense of space and increased under-seat capacity;
- 10% more cabin storage space and 30% more carry-on capacity enables up to 70% of passengers to store their roller bags overhead;
- LED lighting creates a warmer and more welcoming environment, while improving energy efficiency and weighing less than other lighting systems;
- Optional two-class configuration includes a first-class offering with wider seats (2+1 layout), more space, windows for each row, and large armrest tables;
- Optional jetway-capable forward door – with a new spacious entrance area.

to be considered – a luxury high-performance car is a dream for but a few people, whereas an aircraft has a larger number of end users. An aircraft cabin has to meet the many requirements of business passengers and combine premium aesthetics and comfort with ergonomics, quality, functionality, easy maintenance and economic efficiency. As a result, a designer cannot just consider cosmetic and decorative elements, he also has to consider quality of materials and components and the correct quality-price ratio.”

Looking forward, Giugiaro has every confidence the project will help it realise further aviation projects: “Working with such a world leader in the turboprop market meant a remarkable, intense and interesting exchange of experiences and inspirations – which we think are the key success factors for future programmes.”

ATR’s flight testing programme for the 600 series continues, however chief executive Filippo Bagnato is adamant the first -600 will be delivered to Royal Air Maroc in the second quarter of next year after the carrier ordered two ATR 42-600s and four ATR 72-600s in March 2009. The Armonia interior will also be available as a retrofit option on older ATR-500 Series aircraft. ☒

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shelflife

The use of commercial off-the-shelf (COTS) technology for handheld IFE is so over – or is it?

BRENDAN GALLAGHER, AIRCRAFT INTERIORS INTERNATIONAL



Earlier this year The IMS Company did what handheld IFE providers are always doing – it unveiled a new device. Called the Edge, the gadget is the latest in a very long string of products from several suppliers to appear on a market that has become a byword for volatility since its creation in 2005.

With more than 24 hours of battery life and a monster 4TB of content storage, Edge is a powerful performer that will have IMS's competitors scrambling to catch up. More significantly, though, this 7in widescreen device (weighing only 1lb) represents a complete change of strategy by the Californian company. In recent years IMS has pinned its faith on adapted consumer-market personal media players from Archos of France – performing a volte-face, IMS decided that Edge would be purpose-built.

"IFE portables are becoming commoditised, with very specific requirements: the industry wants a 7in screen, a rugged case, the storage capacity of a fileserver and a

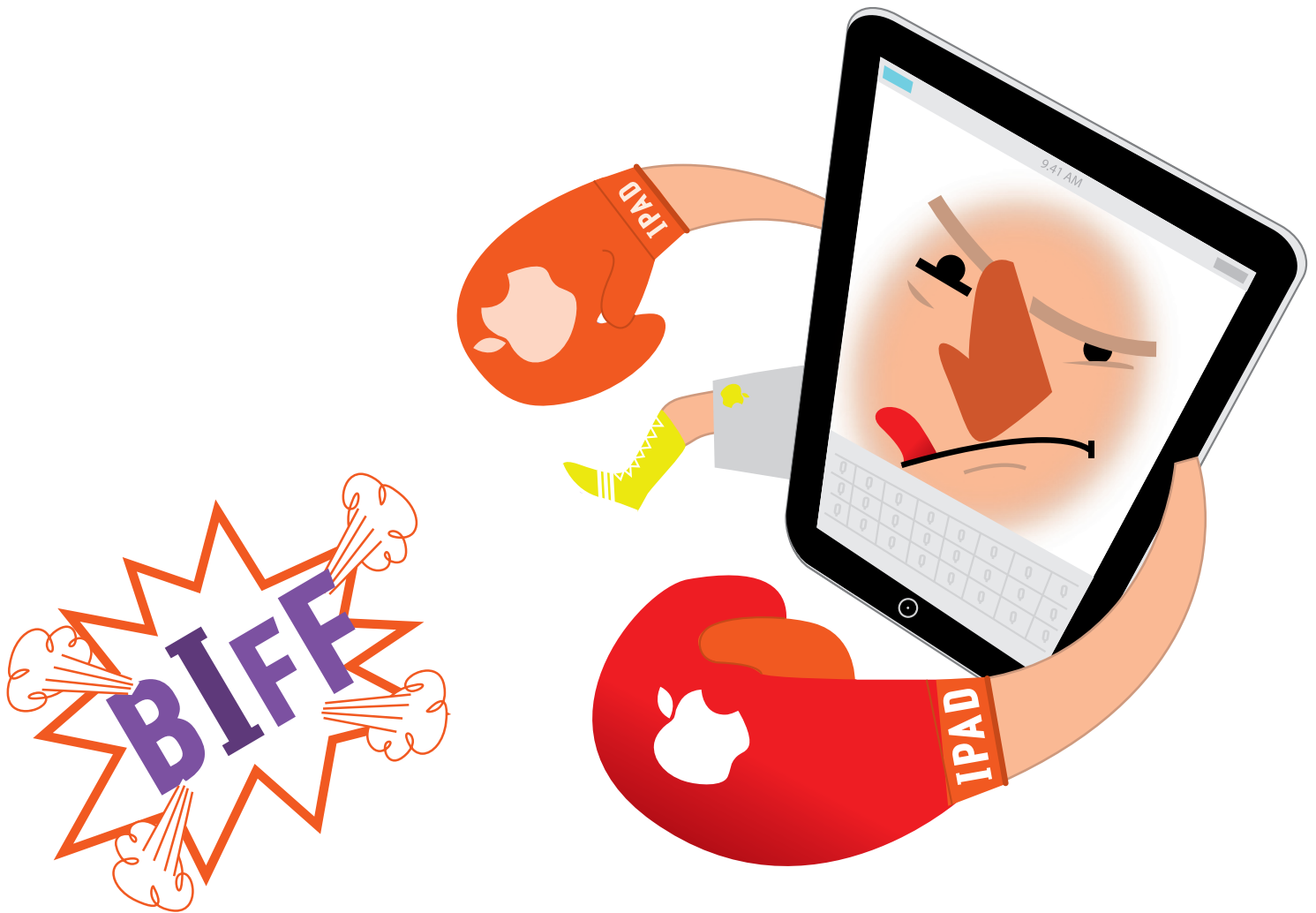
battery that lasts a day, all for US\$500," says IMS chief executive Joe Renton. "Meantime, the mass consumer market has settled on 5in screens, less rugged cases, and storage and battery capacity less fitted to the needs of IFE. As a result, it's now more difficult to cost-effectively repurpose commercial off-the-shelf products to get what our airline customers are asking for."

IMS's decision to resume the purpose-built path – the company developed its first generation from scratch before moving to Archos-based products – sets it apart from the competition. Bluebox Avionics (see sidebar) and IFE Services are wedded to COTS, while chief rival digEcor has stuck to its purpose-built guns from the very beginning.

Joe Renton resumes the case against COTS: "It's becoming a market of iPhones and iPads, which meet only a limited range of requirements in IFE," he asserts. "We looked into the next generation of COTS devices and knew it was time for us to offer something complementary to our

ROUND 2 BIG FIGHT





WATINAYAH IS USING L7 TO PROVIDE 300 HOURS OF CONTENT IN ITS PREMIUM ECONOMY AND BUSINESS/FIRST CABINS



current products. In our view, the relevance of COTS to IFE will be significantly diminished in the next few years.”

The new IMS device would give any consumer electronics product a real run for its money. As the only IFE handheld so far to feature Secure Digital (SD) solid-state storage instead of a conventional hard disc, it offers a staggering amount of content capacity: 4TB is enough for around 2,000 movies. With an extended-life battery, bringing weight to 1.8 lb, EDGE can play encrypted video non-stop for more than 24 hours – an endurance that IMS describes as the best on the market. And even with a standard battery, reducing player weight to 1.2 lb, it’s still good for eight hours.

NUMERIC ORDER Utah-based digEcor – inheritor of the original player that started the handheld ball rolling, and

IMS’s chief rival for dominance of the handheld space – has always ploughed its own furrow. The company’s latest products, developed in collaboration with Shanghai-based Lefeel Media Technology, are the digEplayer L7 and L10 – the numbers indicate the size of the touchscreen.

Nose to nose with Edge, the L-series players appear to come off second-best. Battery life is put at “over 18 hours” and storage is a hard disc-based maximum of 160Gb. But the formula has been good enough for three customers so far this year – leisure carrier Thomas Cook Airlines of Belgium, Azerbaijan Airlines and, most recently, Kuwait-based premium-only operator Wataniya Airways.

Wataniya is using L7 to provide 300 hours of content – Hollywood movies with Arabic subtitles, Arabic movies, Arabic and English television programming, music, music videos and games – in the premium-economy and business/first cabins on its Airbus A320 fleet. The players are available initially on flights from Kuwait to Vienna and Istanbul; it is planned to put them on the rest of the airline’s routes in due course. They are offered free of charge in premium economy, and on request as a supplement to the Thales TopSeries in-seat IFE in business/first.

Adam Williams, digEcor’s spokesman, has no doubt that the company’s time-honoured practice of purpose-building is still the way to go: “We will continue to develop and offer purpose-built devices for the foreseeable future,”




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bluebox trial

Rick Stuart's Bluebox Avionics has been busy preparing the iPad for use by Australian long-haul, low-fare operator Jetstar Airways, which trialled the device in June with service introduction on 55 aircraft originally planned for October. "The timeline has slipped a little," he admits. "We spotted a potential snag a couple of months ago and are working to resolve it. We're dealing with Apple, don't forget, so it didn't really come as a surprise."

Snag or no snag, Stuart already has his eyes open for the Next Big Thing in consumer electronics. "iPad is a great machine, but greatness is short-lived in the fast-changing world of consumer electronics," he says. "It seems the airlines are prepared to embrace rapid change in this marketplace as they strive to give their passengers an onboard experience as close as possible to what they are used to on the ground."

So what next? "For us iPad has always been an interesting device, but one among many and not necessarily definitive," says Stuart. "The next version of iPad will be upon us shortly, and we have also been looking at other technologies – the conveyor belt never stops. We have still to see anything as good as iPad from a credibility point of view, but that doesn't mean we'll stop searching."

he says. "We believe it's in the airlines' best interests. For example, the carriers, their staff and their passengers can all influence the design: we surveyed thousands of passengers and sought the views of airline personnel before releasing the L-series."

COTS has industrial downsides too, Williams contends. "First, the original manufacturer has to be involved in any modification. If he's unwilling to cooperate, or demands too steep a price, the device remains generic and less capable of meeting the airlines' needs. Our way, we own the intellectual property and can control the product roadmap. Second, COTS devices are aimed at the mass consumer and, not surprisingly, don't have the ruggedness and content loading provision that are fundamental to success in the air transport environment."

LETTER SPLIT Today's hottest ticket among the repurposing school is the sleek and shiny iPad. Though Williams is a fan, he thinks the Apple icon is the wrong horse for this course. "I love my iPad, but it was simply not designed with IFE use in mind. To name but a few of its drawbacks for this application, it has no kickstand, credit-card swipe or hard drive, the screen is vulnerable to damage, you can't hot-swap the battery, and the warranty is voided if modifications are made."

Nor may the business model withstand too much scrutiny, in Williams' view: "Apple requires the use of an approved third party for all repairs," he points out. "In the first programme to put iPads aboard airliners, the operator has bought the devices, a second company is putting



ROUND BIG FIGHT 2

“

COTS ALLOWS THE CUSTOMER TO JUMP
ONTO THE CONVEYOR BELT OF CONSUMER
ELECTRONICS ”



01. IMS Edge
02. digEplayer L7

content on them, a third is trying to incorporate studio-approved security, and a fourth will handle all repairs. That's a lot of people all trying to make a profit."

SHELVE THAT Leading the defence for COTS is Bluebox managing director Rick Stuart. "Obsolescence is the key," he declares. "This will always be a problem, whichever approach you take. But COTS allows the customer to jump onto the conveyor belt of consumer electronics, whereas purpose-built systems can remain fixed for what can be a very long time in the IT world."

Purpose-building made a good job of getting the handheld market started, Stuart says, but now it's had its day: "I think it's a very outdated concept. Moreover, I'm not convinced that a purpose-built device can ever come close to matching the build quality and intensive testing typical of a consumer electronics programme – the portable IFE market is not huge, and purpose-builders constantly face the possibility that they will never recover their development costs."

British company IFE Services has quietly made a success of COTS, repurposing the Sony PSP games console to such good effect that it has chalked up no fewer than eight customers in the last couple of years. With 11 hours

of battery life and a sharp LCD TFT screen, IFE Services' PSP implementation has been adopted by, among others, British low-fare operator easyJet and leisure carriers Thomas Cook Airlines, Thomson Airways and Viking Airlines UK.

Games are the main driver behind IFE Services' choice of the Sony device. The PSP can play movies but the company is reported not to be currently pursuing early-window content approval from the studios because it thinks the low-fare and leisure markets are happy with a games player that also runs a couple of classic films.

The jury is out in the case of COTS versus purpose-built for handheld IFE. Of the two biggest vendors, one never left the do-it-yourself camp while the other is back after an excursion into repurposing. Two lesser but promising players are banging the drum hard for consumer electronics. Is one or the other the only way, or can each be made to work? Such is the quicksilver nature of this market, we probably won't have to wait long to find out. ☒

CONTACTS

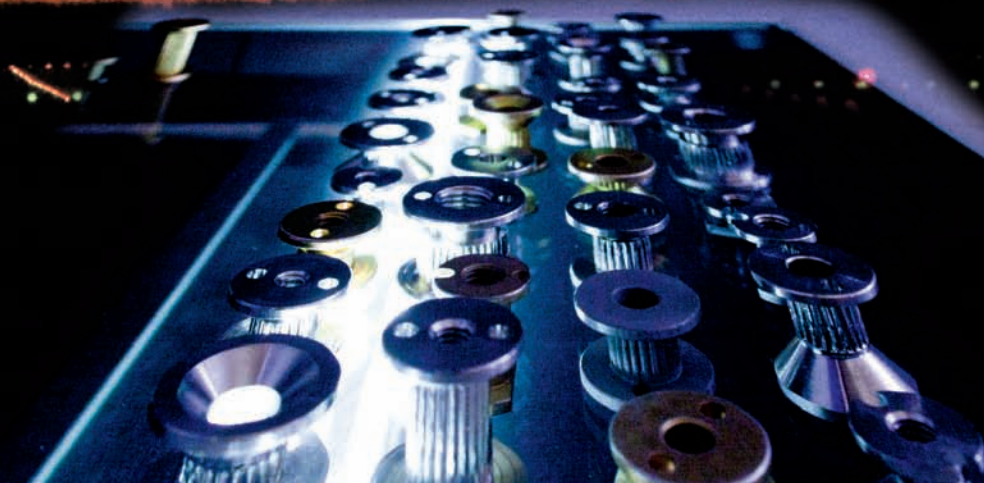
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custom made

Over the last two years, Tapis has developed custom grains and finishes with its Ultraleather faux leather for the business- and first-class cabins of Singapore Airlines, Etihad Airways, Swiss Air, Kingfisher Airlines, and JAL. On each occasion, Tapis created a customised programme that passes FAA commercial testing to meet the airline's precise needs for texture and colour.

The company says its custom grain capabilities enable airlines to use luxurious soft goods that perform, and match the original hide that appears in other parts of the aircraft – instead of using a laminate or painted surface.

Ultraleather is made of polycarbonate, a resin that Tapis says offers durability, as well as high resistance to heat and light.

www.tapiscorp.com

Tapis



Lantal

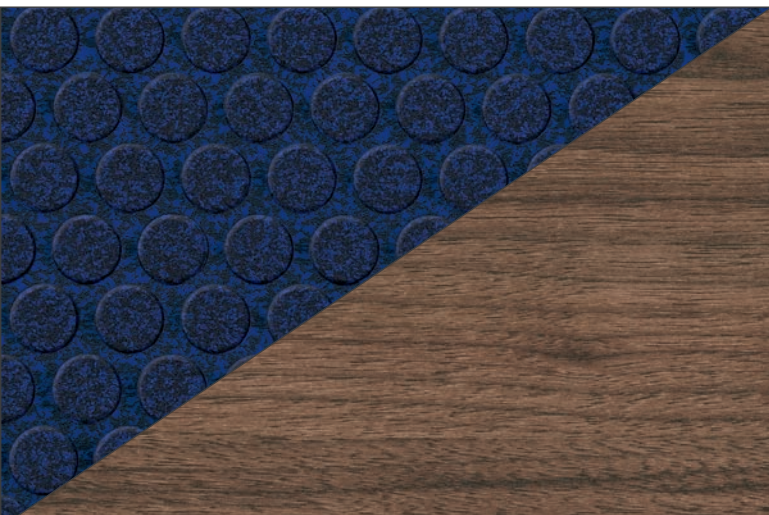
prime cut

Lantal's laser-cut curtains are particularly aimed at business- and first-class applications. Individual designs, colours, and, through laser cutting, varying grades of transparency, can be achieved to create signature interiors. Customised to match the overall cabin design, the curtains can be coordinated with the upholstery fabrics or used to create subtle accents or striking contrasts. There are no limits to the size and shape of apertures that can be produced by the laser machine.

Lantal's curtains are heat-set pleated to preserve the original crispness of the pleats for the entire service life of the product. Pleating also minimises the space required to tie back curtains when they are open. The company says its laser-cut curtains are tailored precisely to their location on board, delivered ready to hang, and fulfil all airworthiness requirements.

www.lantal.com





hold the floor

Gerflor recently launched the Batiflex AVR175 and AV135 ABD0031 and FAR 25.853 non-textile floor coverings. Both are designed to provide excellent anti-slip, durability, dimensional stability, ease of cleaning and maintenance. They are available in rolls for simple installation, fewer seams, ease of storage, and minimised wastage. Batiflex AV135 is available in a variety of plain colours and in wood and mineral decors, all suitable for installation in entrance/exit areas, galleys and lavatories.

The company has also developed Batiflex carpet look-a-like floor coverings for installation in galleys, aisles and/or the full cabin – Batiflex AV135 and AVM282. These are designed to offer outstanding durability and easier cleaning and maintenance than traditional wool or nylon carpets.

www.gerflor.com

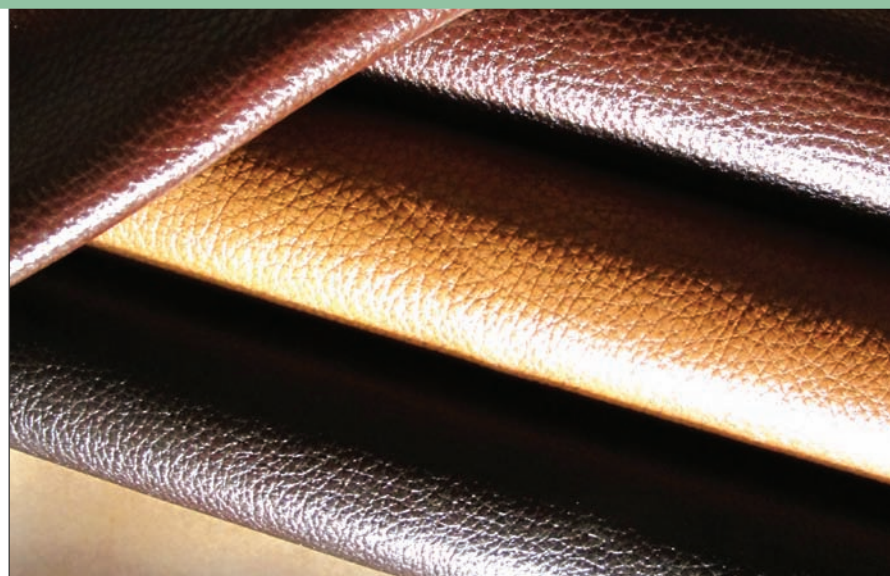
Gerflor

Townsend

back to nature

Townsend Leather launched two new premium leather products at the 2010 NBAA Annual Meeting and Convention (held in Atlanta, Georgia, USA on 19-21 October, 2010) – Vertucci Calfskin and Deerskin. Both are offered in three earth-tone colours – burgundy, golden tan and rich brown – which are hand-rubbed to bring out all the leather's natural characteristics and beauty. These are available for shipment in approximately four weeks. Custom colours are available with a lead-time of four to five weeks. The old-world, classic look of these leathers were inspired by European designs.

www.townsendleather.com



invisible ink

Willow Tex, manufacturer of Izit Leather Enhanced, has developed a proprietary ink blocking finish that it says makes permanent ink marks on aircraft seat covers virtually a thing of the past.

"With this development, airlines do not have to contend with frequently exchanging leather seat covers to clean and re-dye them due to incidental pen marks from passengers," says Drew Clabough, general manager at the company. "The operational cost savings to an airline are significant."

The company says the ink blocking technology makes Izit Enhanced impervious to dirt and stains – the seats can be cleaned 'on wing' with soap and water, without the need for special after-care conditioners.

In addition to its soft calfskin-like feel, the company says Izit provides the customer with substantial weight savings compared with natural leather – 2 lb per passenger place in payload weight.

www.izitleather.com

Willow Tex



production gains

A £6 million Thermal Energy Plant (TEP) is set to revolutionise leather production at the Scottish Leather Group, of which Andrew Muirhead and Son is a subsidiary. Opened by the Princess Royal in July 2010, the fully commissioned TEP will use the 30,000 tonnes of waste generated by the group's subsidiaries to generate approximately 45 million kW per year. The power will be used to run the group's tannery in Bridge of Weir, Scotland. The plant can process up to 100 tonnes of waste a day.

Recent contracts for Andrew Muirhead and Son include Malaysia Airlines, which appointed the company to deliver a new interior scheme for its Boeing and Airbus fleet. The company is also working with Cebu Pacific on its fleet of A320s, and continuing its long association with Singapore Airlines on a newly let refurbishment contract. In addition, following the merger of Olympic Airways and Aegean, the company is supplying the new interiors on Olympic's fleet to bring it into line with Aegean's colour scheme, which it recently delivered.

www.muirhead.co.uk

Andrew Muirhead

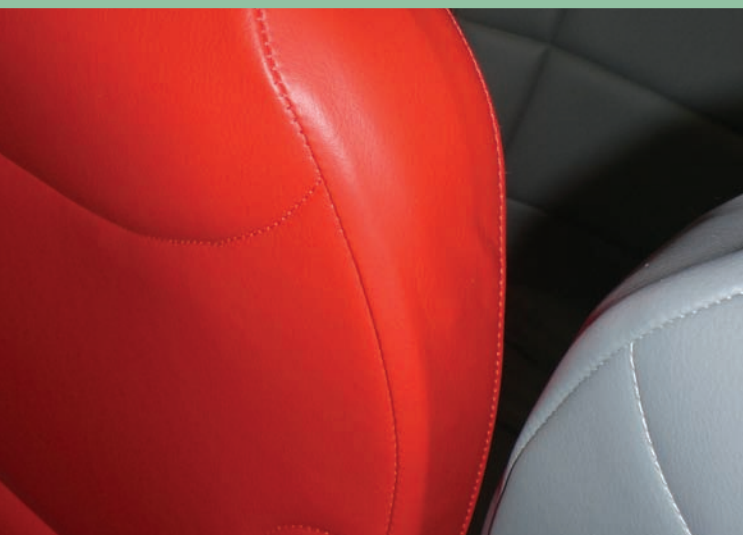
Sailmaker

set sail

Sailmaker International says its LeatherMotive range shows minimal reaction to climatic variations – when exposed to the sun it retains a feeling of coolness, whereas in the cold it transmits a sensation of warmth. The material is anti-microbial, mildew-proof and odourless and is designed for use in high-traffic areas – the company says it is very resistant, with an elasticity that gives the stitching a longer life than the seams on vinyl-coated textiles or equally soft leather.

The company also says that LeatherMotive has passed all the auto-extinguishing tests that it has been submitted to, for use in naval, automotive, railway, aeronautic and public hospitality situations; and passes the naval, railway and aeronautic smoke toxicity and opacity tests. LeatherMotive does not include any plasticisers, heavy metals or stabilisers.

www.sailmakerint.com



ever green

Over 30 airlines worldwide are currently flying with E-Leather's eponymous material, which is made by combining reclaimed natural leather fibres and a high-performance core, using only the power of water. The result is a material designed to be durable, wipe-clean and hygienic.

The company also highlights the product's eco credentials, saying it is manufactured in an eco-friendly way, and boasts reduced weight, leading to reduced fuel costs and lower maintenance, and a smaller carbon footprint. The material is also designed to retain its appearance despite the toughest operating conditions, and upholster well without bagging.

www.eleathergroup.com

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lightfantastic

A look at the latest lighting products designed to make the aircraft cabin safe, attractive and flexible

IZZY KINGTON, AIRCRAFT INTERIORS INTERNATIONAL

Astronics LSI

safety light

Astronics Luminescent Systems (LSI) has continued to evolve its offering of emergency exit lighting and passenger information signs. Astronics-LSI offers a complete system including ceiling emergency lights, emergency exit signs, seat- and galley-mounted aisle floodlights and passenger information signs developed specifically for the next generation of transport aircraft. Passenger information signs are available in a multitude of colours to match any interior scheme, and automatically dim to match the ambient light level in the cabin via an integral photosensor. All of the products utilise LED technology, which the

company says results in longer life, thinner profile, less weight, and reduced power consumption when compared with legacy solutions.

In May 2010 the company announced it had been selected by Diehl Aerospace to design, develop and supply the electrical emergency lighting and passenger information signs for the A350 XWB programme. Diehl Aerospace was selected by Airbus as the prime contractor to supply the entire cabin and cargo lighting package for the new A350 XWB family.

www.astronics.com



great white

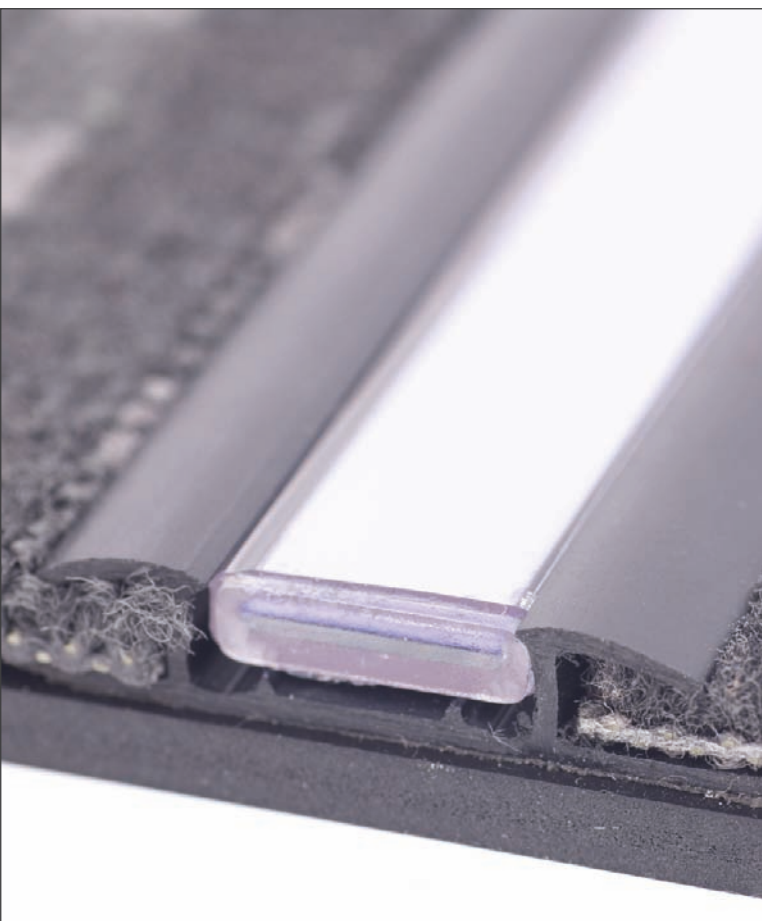
Emteq recently introduced a new variable white lighting system for aircraft that is capable of outputting many shades of white light – to provide a bright environment for inflight working, or a cozy atmosphere for relaxation. Daylight is digitally controlled via Emteq's Cabin Lighting Network Protocol (CLNP). Built-in channel regulation and control eliminate the need for external power supplies, dimming modules and other additional hardware.

Dynamic control of cabin lighting on a single bus with Daylight includes control of white colour temperatures, intensity values, fade times, as well as control among groups or zones of lights.

The company says utilising the latest LED technology implies optimal light intensity at low power. The Daylight system not only varies in white colour temperature, but also offers variable dimming from 0-100%. It is available in two profile tracks for different PSU types.

www.emteq.com

Emteq



meet your match

STG Aerospace says that ColorMatch OC (over carpet), the most recent addition to its SafTGlo range, is increasingly popular. The coloured photoluminescent floorpath marking system is available in two widths, is designed to enable close fitting to cabin features, and incorporates drainage channels. The 'hinged wing' design grips and hides unbound carpet edges, which the company says also simplifies carpet replacement.

STG's orders in 2010 have included Thai Airways International, which fitted the 6,000th installation of SafTGlo; and most recently, Trans States Airlines, which ordered the system for retrofit on 12 aircraft.

Orders are also increasing for STG's Wireless Emergency Primary Power System (WEPPS). WEPPS uses approved 'fit-for-life' non-rechargeable battery modules to replace conventional NiCad battery/charger packs. The company says this reduces operating costs by eliminating battery maintenance from emergency lighting. The system is now sold in every continent worldwide.

www.stgaerospace.com

STG Aerospace

Schott Aviation

simple pleasures

Schott Aviation has developed a new family of in-seat reading lights that is available in a large array of colours, materials, head designs and illumination characteristics. The idea was to combine great aesthetic design with simplicity.

Customers can choose from five types of reading lights – two compact and three classic versions. The technology is based on a single LED, which the company says enables slim and elegant designs in combination with strong performance in illumination and lifetime.

The company says the products' standardised interfaces, wide range of input voltage and their pre-qualification status for all Boeing and Airbus aircraft, makes it easier to integrate them into monuments.

www.schott.com/lightingimaging





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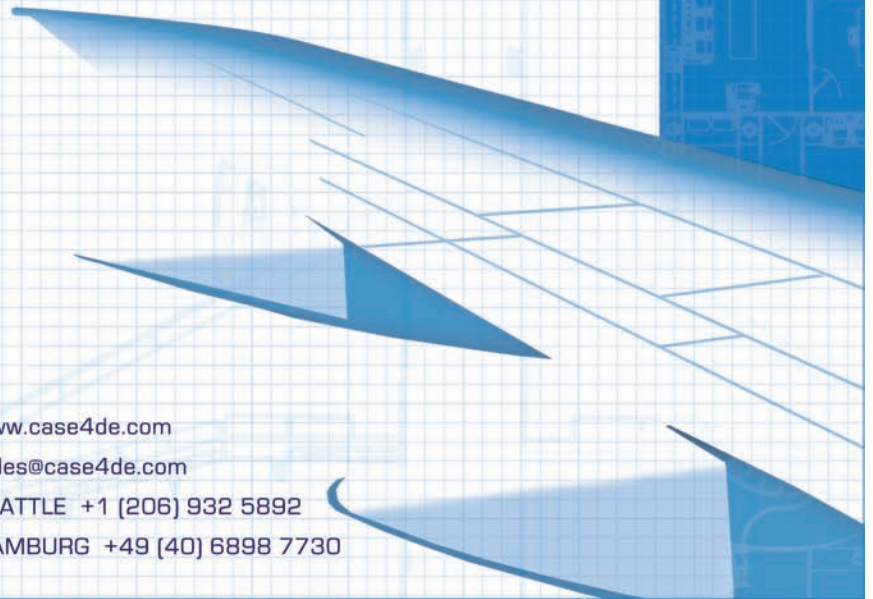
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When designer David Scott couldn't find the material he wanted, he teamed up with Kydex to find a solution

a problem shared

Kydex says the industry's stringent regulations and seating suppliers' production requirements have made it challenging to produce unique effects for thermoformed interior components. Kydex and international designer David Scott joined forces to revolutionise the way airline designers approach projects.

"Sometimes a unique colour or effect can only be achieved by applying a film to the thermoplastic sheet substrate. This makes the product less durable and difficult to fix if damaged," says Ronn Cort, international business manager at Kydex. "With the high cost and time of repairs, designers and seating suppliers gravitate to more readily available materials. However, designers are looking for ways to leverage new lighting systems to play with refraction and metamerism and create environments that change throughout the flight's duration."

Scott was working as an interior designer in a team charged with redesigning the interior brand experience of a major airline. He received a box from Kydex – a leader in manufacturing thermoplastic sheet for airline seats, shrouds, tray tables, IFE components, galleys and more – that contained a variety of colour samples. Upon learning that the colours he sought to achieve a dreamy, cloud-like environment were not available in aviation-compliant material, Scott realised there was an opportunity to work with a supplier to develop the product desired.

Scott and Kydex laboratory technicians worked together for three months to develop a raw material with contemporary design appeal and pleasing aesthetic properties. Since Kydex sheet can transform into different colours and gloss

when heated, Scott says designers shouldn't make decisions based upon a flat sheet and should see how the material will respond in different forms. "I will create one look for the back of a seat – it needs to reflect light – but I want a different experience as the traveller is resting in the seat," says Scott. "The headrest needs to envelop and soothe the occupant, and he should emerge from the flight feeling excited about his experience."

Independent laboratories verified the product contained the properties of Kydex sheet and was compliant with FAA regulations. The result is a pearlescent material with violet undertones, that reflects and refracts light, which Kydex says makes scratches less obvious.

Cort and Scott agree that suppliers and designers can work together successfully to resolve issues involving cost, compliance, lead time, weight constraints, and passenger comfort and satisfaction. Cort believes that early collaboration with designers can help airlines and seating companies contain costs. "It can cost as much as US\$100,000 to make a material change after seat certification, so designers and suppliers should work together from design inception," he says.

Scott and Kydex have since continued their collaboration on a collection of 28 colours in this material – the Kydex 6503 line. "Think about what you want, and then work with suppliers to make it compliant," says Scott. "I hope my experience inspires other designers to work with suppliers like Kydex to develop the kind of products that provide travellers with a new level of experience."

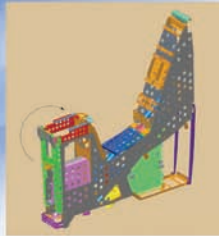
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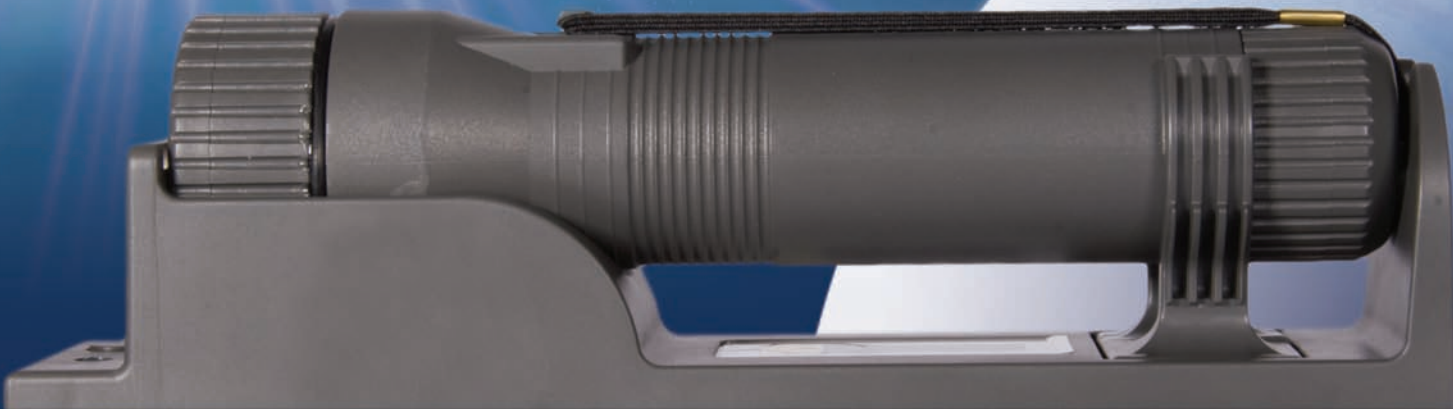
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Responding to requests for flooring that would fit airlines' brand differentiation aims, Schneller designed more than 30 new colours and designs

flooredgenius

Many airlines request custom décor – laminates and flooring designed specifically to create a customer experience that is the embodiment of their brand. However, many airframe manufacturers have started to advocate the selection of certain cabin interior décor from a standardised offering. To ensure customers still have access to custom designs, Schneller has introduced an enhanced catalogue offering with two new textures and over 30 new colours and designs.

One of the primary challenges of this industry, the company says, is to create compelling environments for passengers using materials required to meet the stringent regulatory requirements of commercial aviation. Also tackling the need to reduce weight and meet demanding delivery schedules, Schneller has taken a proactive approach to flooring design. "Customers will always want custom, proprietary décor – it is the hallmark of our business. However, it became clear we needed to adapt to industry dynamics and provide innovative solutions without waiting for a specific programme for justification," says Diane Geisler, director of marketing and business development at Schneller.

The two new qualified flooring textures were designed in response to customer requests for more natural aesthetics, similar to materials they would use in their homes. In addition to visual appeal, careful consideration was given throughout to the technical aspects of flooring

design – alignment, ease of cleaning, seaming, durability, and slip resistance. "Schneller has a 45-year history of supplying innovative cabin décor for the world's leading airlines," says Geisler. "We use this breadth of experience to design products that meet the exacting requirements of this industry, at every level."

The design team at Schneller worked closely with airlines, designers, and other customers to develop the selection for this year's catalogue. The new colours and patterns were designed to provide designers with the breadth of selection to complement their branding yet enable them to operate within the recommendations of various airframe manufacturers. The offering is comprised of warm colours, neutral patterns and accent colours in tune with industry trends and emerging geographic markets such as the Middle East and Latin America. "While many airlines will continue to select the traditional non-textile flooring designs, we were compelled to provide options for customers looking to provide more distinct cabin interiors," says Geisler. "Our customers can expect to see continued developments in the future."

Schneller is a leader in the development and production of engineered decorative laminates and non-textile flooring for aviation and ground transportation. The company provides continuous roll and sheet production from its ISO-9001/AS9100 with Design certified production facilities in the USA, and sales and services support offices in France and Singapore.

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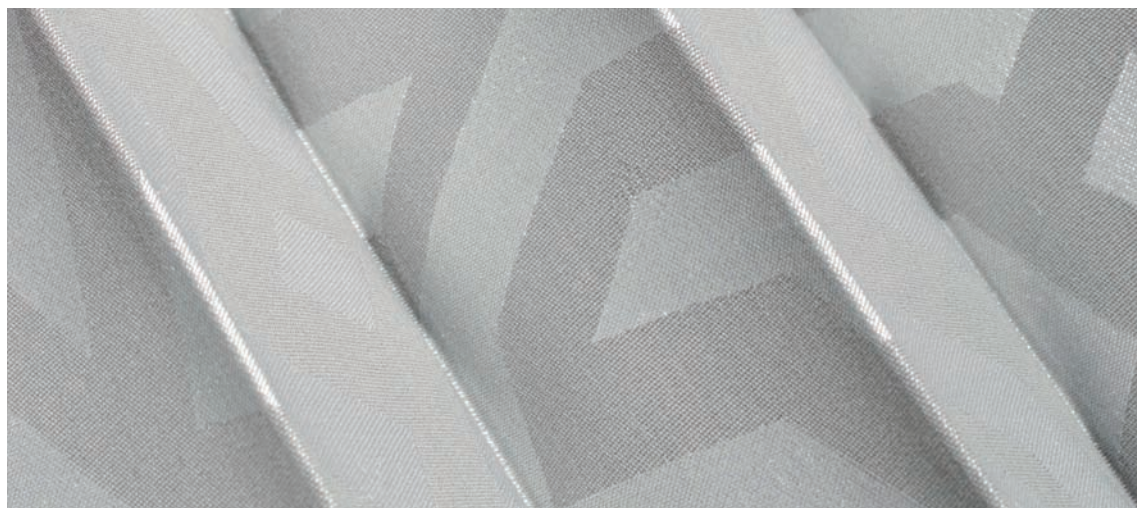
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Tisca Tiara offers textiles for the entire cabin – from carpets and seat covers to steam-pleated curtains

single**source**

The Swiss company Tisca Tiara designs, develops and manufactures all sorts of carpets, seat cover fabrics and curtains for the cabin interior, under one roof. Established in 1940, the company is still run by the founding family, in fact by its third generation. "When my grandfather founded the company in the midst of World War II, it was very difficult to purchase yarns and other supplies, so he started to recycle used textiles to gain the required raw materials – very humble, yet also visionary and innovative beginnings!" says Matthias Tischhauser, manager of the company's mobility textiles division. "We have grown to become one of the leading manufacturers of premium-quality textiles for the transportation, contract and home-textiles market."

The company is still entirely privately owned, without the involvement of any other third parties. "This makes us completely independent from banks or any other financiers – a fact that our customers value more and more, especially in economic rough times," says Tischhauser. "It assures them they can always rely on our quality and competitive prices, as we have no external pressure to maximise short-term performance by compromising on either aspect."

In addition to carpets, seat cover and curtain fabrics, the company also produces steam-pleated 'ready-to-fly' curtains. One of the things that sets Tisca Tiara apart is that it not only produces the fabrics, but also processes the curtains in-house, without having to subcontract to other companies. "That makes everything much faster, easier and cheaper for our customers," says Tischhauser. Moreover, the company maintains a huge stock programme, with over 1,500 different curtain fabrics to choose from, with all sorts of colours, patterns and qualities available. "As a

result we are in a position to serve customers with ready-to-install, steam-pleated curtains within only a couple of days," says Tischhauser.

Instead of being stitched, the curtains are steam-pleated, which the company says makes the look and feel very premium and elegant. Moreover, the curtains can be washed, as the pleats are permanent and designed to keep their shape and style. Additionally, Tisca Tiara says its curtains are permanently and inherently flame retardant, boasting low smoke and toxicity characteristics. When it comes to customisation, customers can choose any design and colour for the curtain fabric. Tisca Tiara also offers various pleat depths and sizes, single- or double-layer curtains, light-blocking and noise-absorbing curtains, slider and hook systems designed for easy installation, and various types of snap fasteners. "We ensure the protection of our customers' investment through craftsmanship that results in long-lasting, superior-quality curtains," says Tischhauser.

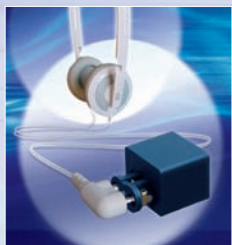
At the 2010 Aircraft Interiors Expo (held in Hamburg, Germany, on 18-20 May 2010), the company introduced Trend, a new collection of carpets, seat cover and curtain fabrics that incorporates the latest global trends in terms of designs, textures and colour combinations. The idea behind the new collection is to support airlines to differentiate themselves from the competition through better design. Furthermore, a new Basic collection has been introduced, which is available off the shelf. This collection was developed for customers that need quick deliveries and short implementation schedules, while aiming to fulfil demands for lower maintenance costs, easy handling, high durability and economical lifecycle costs.

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part and parcel

The Sacs Aerospace Group was formed in 2006 with the merger of Sacs and Boysen. The group focuses on the development, production and sale of locking and connecting systems, as well as special solutions for the aviation industry.

Sacs is located in Rottweil, Germany, and was formed in 2002 as a specialist in the production of fastening and connecting systems. Sacs is also a specialist in the development and manufacture of aircraft interiors. Its product range for business jets incorporates table mechanisms, partition door mechanisms, damped hinges, armrests, flight book holders, and metallic parts. It also offers a variety of latches (pin, hook, trigger, double button and emergency exit door), tie rods and struts, as well as standard parts such as inserts, studs, bolts, washers, nuts and screws. System offerings include the Ram air system for the A318-A321 aircraft, flanges fuel system for the A380 and B787, and assemblies for the ARJ21.

Boysen was founded in 1967 and produces washers and nuts for the aerospace industry. Its main business is the distribution of aerospace fasteners, with over 12,000 different parts in stock. Boysen's headquarters, sales office and warehouse is in Munich, Germany, and it has additional sales offices in Hamburg, Germany, as well as in the UK and France. Boysen says its global network of representatives ensures that it

can respond quickly and that orders are processed on time. Boysen's product range in Munich incorporates (but is not limited to) metric and unified fasteners and electrical components. These include screws, nuts, washers, rivets, inserts, hi-loks, latches, bolts, straps, bushings, collars, wires, springs, fitting, hinges, swivels, hinge bearings, sleeves, terminals, connectors, shims, balls, bearings, ground straps, seals, rings, clamps, cables, split pins, pins, sockets, binders, cylinders, and tools.

The Sacs Aerospace Group regularly exhibits at the Aircraft Interiors Expo in Hamburg, and in 2011 will also exhibit at Aero India 2011 (to be held in Bengaluru on 9-13 February 2011).



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topmarks

Adhetec is introducing a new generation of technical markings which are applied on the exterior coating of all commercial aircraft, for maintenance or security purposes. This technologically advanced type of self-adhesive placard is the result of three years of research and development. The company believes the launch of Adhemark 13880 is a milestone in the long debate over which is better – decaled or stenciled markings – as it offers a permanent and long-lasting marking solution.

Resistant to UV, thermal shocks, solvents and hydrocarbons, Adhetec says the thin and transparent film is easy to apply (with no drying time), is compatible with paint systems, and offers very good age resistance. In fact the company says the product can achieve six years of durability with overcoating. This is based on accelerated ageing tests in accordance with manufacturers' specifications and flight qualification tests. The product is designed for application on all parts of the aircraft, including the engine nacelles.

The technical markings are designed to offer durability equivalent to that of paint, with colour-fastness, perfect adhesion and no cracking. Adhetec says the high level of adherence between the clear coat and the marking guarantees a finish and durability never previously attained.



lukehawes

November's 'FaceSpacer' is Luke Hawes, a director at Priestmangoode – the London-based design studio that lists Airbus, Embraer, Lufthansa, Qatar Airways, Virgin Atlantic and, most recently, Turkish Airlines among its clients. The studio also designs hotel rooms – and Luke is no stranger to nights away from home.

01 WHEN DID YOU KNOW YOU WANTED TO BE A DESIGNER?

I always wanted to be a sportsman; golfer, footballer, snooker player – but then I discovered the creative world of problem solving, detailing and styling. No physical fitness required, but performance still key – design is just as compelling and equally competitive!

02 AND NOW YOU DESIGN AIRCRAFT INTERIORS – WHAT ARE THE KEY CHALLENGES?

Customisation is king – how we liaise with the supply base and engineering is critical to fulfil the dreams of our clients and our design team. New material innovation versus certification is another key battle. Another challenge is how to manage my own expectations, knowing perfection is obtainable, yet highly unlikely.

03 WHERE ARE THE REALLY BIG OPPORTUNITIES FOR INNOVATION IN THE AIRLINE WORLD?

Generally, lighter, greener, more efficient materials and better manufacturing. Cabins must feel less industrial, and more useable and familiar. The real winners will be those airlines who marry product detailing and branding. This must inspire a continuous design language for welcome areas, gangway, gate, lounge, signage and ground services. The entire experience has to be considered.

04 WHERE HAVE YOU BEEN IN THE LAST MONTH?

Seattle, Rio de Janeiro, Sao Paulo, Istanbul, Hamburg and Toulouse – and Leighton Buzzard! Too many nights are spent away from home, in the region of 50 per year.



05 AT LEAST TRAVEL BROADENS THE MIND – ANY ANECDOTES OR INSIGHTS?

Perversely, I seem to enjoy things others would rather avoid: turbulence, running for a flight and boarding at the last minute! I still get a buzz from flying and a thrill when in or around aircraft – but nothing beats stepping through my own front door.

06 SOMETHING MUST DRIVE YOU MAD ABOUT AIR TRAVEL?

We can design the best seats and cabin interiors, but all can be tainted in an instant by a rude flight attendant or an unruly passenger. Very annoying. The eye always picks up crass positioning of big plastic attachment parts, signage and pointless placarding – can we lose the no smoking signs and ashtrays everywhere, and get some design into the IFE hardware? We need to speed up boarding and disembarking – on every flight there always seems to be one stressed-out transfer passenger.

07 TALKING OF STRESS, YOU RECENTLY BECAME A DAD – HOW IS IT?

He's eight months old and has already mastered my iPhone – I now know why Apple issued free protective bumpers! Everything I design must now double as a toy – and be edible!

08 YOU ALSO DESIGN HOTELS – ANY FAVOURITES?

The Mandarin Oriental, Bangkok – friendly with excellent service – and what a view; the Oberoi, Lombok – for relaxation and the place I proposed to my wife; Hotel Unique, Sao Paulo – the best sushi on the planet; Langham Place, Hong Kong for its comfort in one of my favourite cities; and any Accor Etap guest room for its unparalleled design (Priestman Goode designed it)!

09 ANY SCARY HOTEL STORIES?

Bed bugs in Italy and lions in Port Elizabeth, South Africa! Generally speaking, hotel room design needs to leave the dark ages. Why have individual pieces of furniture that we never use and only clutter the space? And why do we still queue to check in and check out, get lost in gloomy corridors, and get our arms wet when turning the shower on? Hotels can look to cabin design to maximise function and quality, and optimise the use of light and space.



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