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# AIRBUS CABINS – COMFORT WITHOUT COMPROMISE

Airbus cabins are designed to offer airlines and their passengers the highest levels of comfort, services and efficiency. Passenger comfort has always been a major design consideration at Airbus in order to ensure the best possible passenger experience across all its aircraft families. Airbus cabin designs are not only innovative and attractive, but are also being continuously improved to keep offering travellers the quietest, most comfortable and enjoyable journeys.

Passenger comfort has always been an important differentiator for the airline industry - especially on long range routes. In the future it will become a fundamental deciding factor driving passenger choice and business success. This is why Airbus has always championed passenger comfort with wider cross-sections for wider seats - especially in economy. 18" seats have always been the Airbus standard. Airbus jetliners provide comfort without compromise, accommodating this modern comfort standard in full-service economy class for passengers, while still offering airlines unrivalled operating economics and fuel efficiency.

## A320 Family non-stop cabin innovation

Taking full advantage of the A320's wide fuselage, the A320 cabin offers passengers a more spacious environment and 15 percent more useable overhead stowage volume than its direct competitor plus greater loading capability. A320 operators can choose the cabin product that fits their market: from a wider 18-inch seat for improved comfort to a 25-inch aisle for faster boarding and deplaning allowing turnaround times of 20 minutes or less. The extra width can also be used to innovate and increase revenue by installing the Extra-Wide-Seat, a comfortable 20-inch wide aisle seat which can be sold for a premium while allowing the other seats (centre and window seats in each ‘triple’) to still have the same 17.2-inch width as in the B737. More revenue generating seats can be fitted with Space-Flex, a rear lavatory & galley arrangement which makes better use of the available space at the very back of the aircraft. It also features the first lavatory in the single-aisle market which is accessible to persons-with-reduced-mobility. The innovative offering led to new options on the A321neo, as with Airbus Cabin-Flex, with a new door arrangement, allows airlines to gain up to 16 seats and to use the full available cabin floor space.

## A330 continuous cabin improvement

Across the A330 Family, First and Business Class passengers are rewarded with their preferred window or aisle seats. The eight-abreast seating layout in Economy Class ensures that no passenger is more than one seat from the aisle while offering the best in class seat comfort with 18” wide seats. For passengers, the A330 supports the latest in-flight entertainment, including video-on-demand, mobile phones and email via satellite. A lighter, brighter and more spacious cabin results from updated features that include smoother contours, new interior styling, state-of-the-art LED lighting and newly-designed air conditioning units. Also available for the A330 is appealing mood lighting and a choice of overhead storage options with optimised bin designs. Overall therefore, the A330’s cabin is widely recognised as one of the best in the sky offering a light bright spacious atmosphere, with the quietest cabins in their class, making flying less tiring and more pleasurable.

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**A380 unbeatable passenger experience**
Customers who are now operating the A380 are not only carrying more passengers at a new comfort level, but are also doing so in the most eco-efficient way, while generating the most revenue for airlines. The flagship A380's greater floor space (30 percent more than the Boeing 747-8i) enables airlines to offer passengers in *every* class a new unmatched comfort standard. The unique widebody double-deck arrangement provides extra seating capacity at the same time as improving the passenger experience. The A380's standard 10-abreast seating arrangement already offers an outstanding comfort with a seat width of up to 19", which is a Premium Economy level of width.

Looking to further capitalise on the A380's very wide cabin cross-section, Airbus is currently evaluating an innovative seating concept allowing 11-abreast Economy main-deck seating arrangement, with an in-armrest seat-width of 18". This allows increased seating capacity in the A380 as well as the potential for further Economy class differentiation, hence optimising the aircraft revenue-generating potential to an unprecedented level for operators. Importantly, it also means that even in this configuration, the passengers will enjoy the comfort of an 18" wide seat. With the aim of developing this 11-abreast solution and making it available to our customers, Airbus is currently in discussions with various seat manufacturers.

**A350 XWB: leading the cabin experience into the next decade**
Airbus' newest aircraft – the A350 XWB – features Airbus' most advanced cabin. The eXtra Wide Body fuselage enables generous room in all classes and 18" wide seats at nine-abreast as standard in economy class. The A350 XWB cabin design – with its smooth curves, flowing lines, innovative lighting and wide windows – also generates a pleasant and soothing atmosphere. Wide panoramic windows create large angles of vision, offering passengers of all sizes a good view of the outside world. In short, thanks to its extra wide cross-section especially compared to the narrower Boeing 787's, the A350 XWB will offer passengers the highest comfort standards and allow the airlines to introduce innovative cabin concepts in all classes. The A350 XWB will feature wider seats, wider aisles and with straight sidewalls, will offer more head clearance and more shoulder clearance.

**Crew rest, optimising revenue space**
Across the Airbus families, innovative solutions have been used to provide crew with comfortable and private rest areas while preserving revenue space in the cabin. The brand new A350 XWB cabin features overhead flight and cabin crew rest compartments integrated above galley trolley stowages to maximise installation of revenue seats. On both the A350 XWB and the A380, flight crew rest areas are located so as to allow pilots access without the need to enter the cabin area. The A380 cabin crew rest can be located on the upper or lower deck, depending on each customer's needs.

**Well-Being on-board**
Effective cabin air conditioning is a major factor in maintaining high levels of passenger comfort. Advanced environmental control systems maintain an airy, yet draught-free, environment. The cabin crew have precise control over the temperature in more individual zones of the aircraft throughout the journey, optimizing levels of comfort for passengers at all times. The air in the entire aircraft cabin is completely replaced every two to three minutes and outside air replenishes the cabin air constantly through mixing with the recirculated air.

High efficiency filters remove 99.99 per cent of particulate and organic matter. Together with highly controlled air circulation patterns with no longitudinal flow, even the most miniscule organic materials are efficiently and quickly removed from the cabin.

On the ground, Airbus' unique Volatile Organic Compounds (VOC) converter keeps cabin air free of kerosene odours from other aircraft. In the cabin gaseous filters installed in the recirculation system remove odours produced by cabin services, e.g. during meal service, providing an outstanding level of purity to passengers.

Airbus cabins are also the quietest cabins in the sky, which greatly contributes to passengers being rested on reaching their destination. The A380 cabin beats previous Airbus standards, this comfort feature being highlighted by the reaction of passengers having flown on the aircraft today.

Airbus was the first to introduce ambient 'mood' lighting as a factory fit option on a commercial aircraft in 2001, an option that is now widely adopted. Not only do all Airbus programs offer full white LED cabin lighting, but Ambient LED based lighting can also be fitted on all Airbus aircraft allowing airlines to choose from a palette of up to 16 million colours to "paint" their cabin with Light, and create an atmosphere in line with their branding and colour scheme. Lighting scenarios use colours, brightness levels and dynamic transitions to provide a pleasant and refined cabin atmosphere in all flight phases, helping passengers to minimise jet lag by simulating, for example, sunrise or sunset. The adoption of full LED cabin lighting (right from the first A350 XWB aircraft, and from next year onwards on all other Airbus a/c types) further enriches lighting control, the variety of scenarios, and the quality of the lighting, so that airlines can "make magic" out of light.

**State of the art In-Flight Entertainment**

All Airbus aircraft, from short-medium range A320 Family up to ultra-long range A380, can be fitted with the latest state-of-the-art In-Flight Entertainment (IFE) systems offering passengers individual screens with audio and video on demand throughout the cabin with access to hundreds of high quality audio and video programmes. In addition, passengers can enjoy satellite live television broadcasts, outside live views from landscape cameras and access the internet from their individual monitor.

The integration of the latest generation IFE platforms into the seat preserves passengers' legroom and also gives them the ability to connect their own 'personal electronic devices', such as a smart phone, tablet or laptop to their screen. Not only can they re-charge their devices, but can complement the airline's entertainment offer with their own content, whilst benefiting from the high audio quality headsets and viewing comfort of the larger screens available onboard.

Moreover, in its quest for more robust IFE systems which maximise in-seat availability, deliver the smartest in-seat integration and offer the best passenger legroom, Airbus already offers the next generations of IFE:

- Right from its entry into service, the A350 XWB offers the first ever genuine 4$^{th}$ generation IFE platform and thus outpaces any other aircraft in terms of passenger resting and viewing comfort, whilst providing lower life-cycle cost for the airlines. The 'future-proof' IFE of the A350 XWB delivers high-definition content to all passengers, featuring for the first time 12 inch screens in economy class and touch screen control. Its simpler architecture results in a leaner physical integration. For example, the A350 XWB is the only aircraft which maintains the cabin floor flat even with IFE installed.
- 4$^{th}$ generation IFE products are on also offer on all other Airbus aircraft types, including the A320 which benefits by a new Universal Platform entering into service next year.

- End of 2012, for the first time ever, a new, lighter, cost-effective, and simpler IFE system, based on a seat-centric architecture was installed in production: the A330 “Light IFE”. Light IFE offers are also available now on A320 and A350 XWB.

Continuing on Airbus advantages, onboard wireless services are now offerable on all Airbus aircraft types and provide to the passengers the possibility to access an onboard portal by WiFi from their own PED.

**Airbus, the only airframer offering in-flight connectivity, in production on all aircraft**
In five years, around 60 airlines have committed to connectivity. To respond to this growing market demand, Airbus has developed an aircraft connectivity ‘platform’ which delivers the full breadth of new connectivity services and which is a generation beyond any other available system. In parallel, Airbus integrates alternative offers from other suppliers. Airbus pioneered connectivity and was the first manufacturer to receive certification for its on-board mobile phone system in June 2007. Since winter 2010, Airbus operators have been able to offer to their passengers worldwide broadband connectivity services via internet and mobile telephony. The Airbus platform, called Airline Network Architecture (“ALNA”), is the first connectivity solution available as line-fit on all Airbus aircraft and can be retrofitted to Airbus and other manufacturers’ aircraft. It leverages the widely operated ‘L-band’ aircraft satcoms through ‘SwiftBroadBand’ connectivity with a unique and genuine worldwide coverage and benefits by the continuous addition of new services.

Passengers can use their own wireless communication devices such as mobile telephones, smart phones, tablet or laptops to send and receive SMS messages, e-mails with their attachments, access the internet and social networks, or make and receive occasionally phone calls. Both WiFi and mobile telephony services are praised by passengers especially when travelling for business purpose, in priority for data services. As a result the massive airline uptake in production line of connectivity applies to both services.

In addition, cabin crew can easily manage the service from the Forward Attendant Panel and have the option of selecting a ‘voice-off’ mode to restrict cell-phone usage to data services only. Passengers’ feedback shows the service is a tremendous success, further consolidated by the very rapidly expanding connectivity market. For example, around two thirds of A380 customers plus all operators who have already defined their A350 XWB interior configurations have opted for connectivity.

Furthermore, the scope of connectivity applications enables airlines to reach passengers personally in flight and to generate ancillary revenues. Thanks to its unique communication management, it also serves airline administrative and operational communications, as illustrated by crew mail, digital cabin logbook, documentation viewer, telemedicine, credit card authentication, on board rescheduling of traveller flight correspondences, with more applications to be wirelessly accessible from cabin crew devices in the near future.

Airbus offers by far the most comprehensive combination of connectivity solutions with different IFE suppliers. The A350 XWB native connectivity is illustrated by its standard SBB satcom and by the unique freedom of choice it offers to customers: ALNA, Thales TopConnect (Ka Band) and Panasonic Global Communication Suite (Ku Band). Panasonic GCS also enters into service on A330 & A380 this year.

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