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# Beautiful on the Inside

by Tim Kern, CAM

Comlux A320 interior

Unlike most of the airframe, the interior of a corporate aircraft can reflect its owner's taste. Whether you want a business office, high-altitude sleeper, convention centre or airborne family coach, the interior design can be, within wide limits, whatever you need. Although they may be wide, the limits need to be understood.

Everything is different in an airplane: the walls are long and straight, but not vertical; headroom is limited; traffic flows are restricted; weight and its distribution are important; materials are specialised; repairs are regulated and costly; aircraft availability is minimal. Some shapes work well; several are mandated. All components must meet strict regulations and strict smoke and fire tests.

Tim Callies, Head of Creatives at Comlux, did not begin his career in aircraft. "When I started," he explains, "I thought, 'I can make anything I want!' But it's not like that. Everything is expensive for a reason. It's best to hire an expert, so you don't have to do it over."

Your team will work with aviation-specialty suppliers. "It's a niche market," says Lindsay Boatright, Comlux's Lead Designer at the company's Indianapolis facility. "Everything is important."

From pillows to electronic components, everything must pass aviation tests. That means almost nothing is readily available – it all comes from specialty suppliers. "Fabrics, particularly, get discontinued often," warns Boatright. "When you find what you want, order immediately – and order plenty. Even if it's available later, dyes may not exactly match and many are impossible to duplicate. Some woods are simply unique. Get spares of everything! And remember that you must have quality from the beginning. Quality is not automatic."

## Plan Carefully

"You pick a core design. Then there's the custom work. Even though the design takes a long time, once it is locked in, work goes fast, and changes are expensive," says Callies. "Maybe there are two years of planning; then the opportunity to work on the airplane may not happen for another two. So, don't be too trendy."

"Fabrics pass or fail a fire or smoke test, batch by batch," explains Boatright. "Overall, though, luxury and certification drive costs. The more unique the request, the higher the certification cost."

Boatright urges owners to think realistically: "You sit in a showroom chair for a few minutes; it feels stiff. But you'll be sitting in it for hours. If it's too soft, it won't be comfortable on long flights."

"Customers need to understand the narrowness of an aircraft," notes Callies. "Though many initially think they'd like their fabric to go all the way to the floor [where the cabin is narrowing], they should note that peoples' feet are forced into narrow areas; walls will get scuffed by shoes." »

Textiles



## Mix and Match

“All the popular products we use are natural,” says Callies. “Customers want everything to be perfect, even though they know that grain varies across an animal [or stone, or laminate].” Leathers are not truly uniform either – even across a single hide. Carefully placed vinyl can be used. The key is to match everything to its job, for each panel to function in its place. Does the back of a chair, for instance, need to exactly match the material of the cushion?

In a custom interior, uniformity is optional. Seats need not be identical. Smaller hides can be used to cover the smaller chairs.

“Even high-end leathers, if they’re too supple, can stretch,” explains Boatright. “The naturally supple leathers such as calfskin, lambskin, goatskin are smaller hides. They may be more appropriate for inserts. Use leathers where high wear is expected – but keep the silk away and watch out for high heels.”

“Customers want the comfort, space, and feel of their homes,” says David Velupillai, Airbus’ Product Marketing

Director, Executive & Private Aviation. “At first, a custom interior seems attractive. But this is an aircraft, where you have considerations for weight, shape, flammability. If the aircraft is dedicated to your own use, fine; but if it is to be hired out, other considerations can play a big part in the interior design.” Klaus Buse, Airbus’ Head of Cabin Engineering, adds: “Some customers bring their own designers, perhaps their yacht designer. We work with them to meet aircraft requirements and keep their desired look.”

## Leather Insights

By far the most favoured upholstery material in aircraft furniture is leather. Leather’s durability, feel, and look are appreciated. But all leathers are definitely not the same.

Cleaning is everything. Leather’s nature determines how clean it stays and how long it will last. The type of leather you use, its treatment and dyes comes into play. None of those can be changed after installation.

Leathers are either full grain or top grain and each has its strengths and costs. Full

grain leathers use the full thickness of the hide; top grain leathers use the top (skin) part of the hide, and are necessarily thinner. Suppleness comes partly from thinness and partly from the type of leather – calfskin, goatskin, lambskin. Treatments, dyes and fireproofing also contribute. Good leather should outlast the furniture and foam beneath.

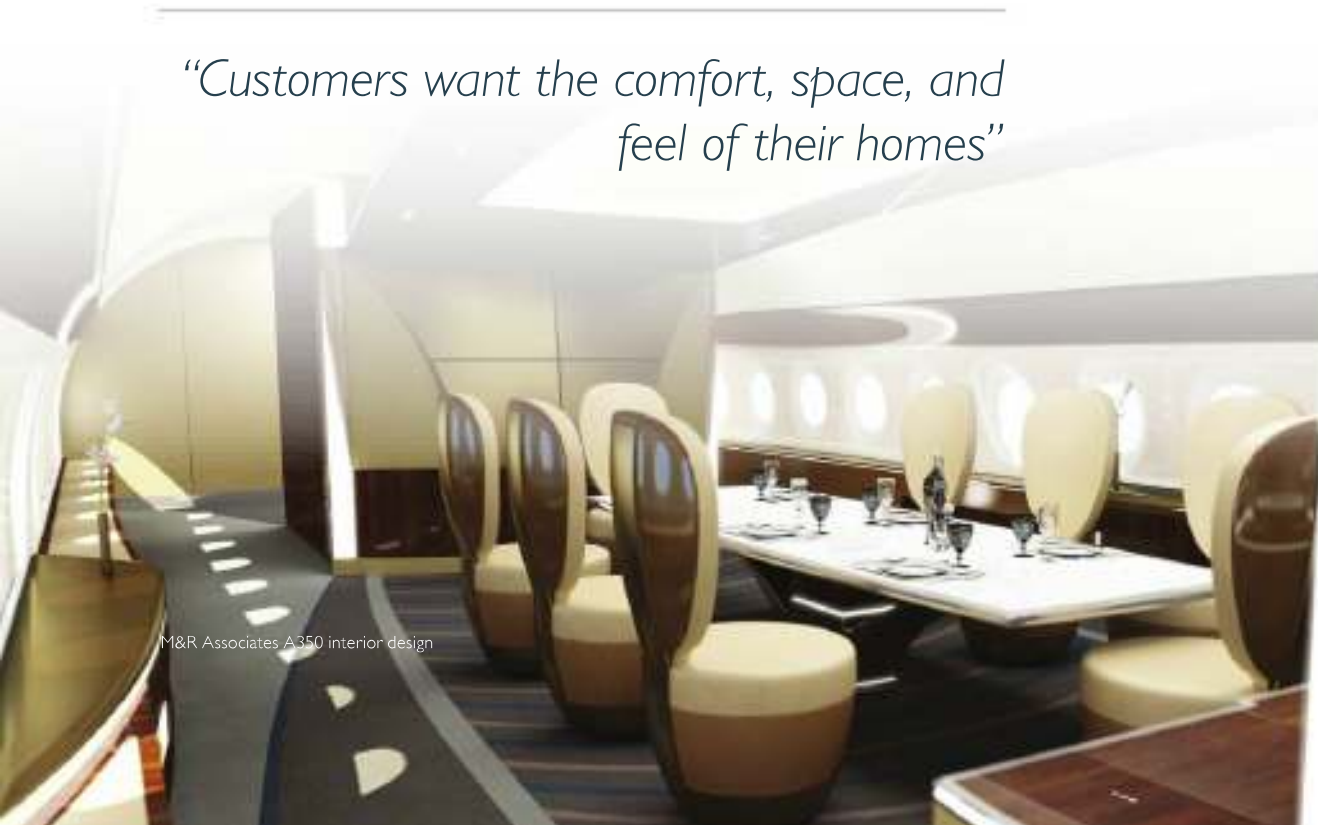
Aircraft interior materials must meet regulatory standards. Buying from a reputable or licensed source is essential but not sufficient. Each batch should be tested before installation, and samples should be retained, both for certification and to preserve a sample of material and dye. Dyes and fire retardant should ideally be applied in the drum, rather than added later; the result can be more suppleness and uniformity.

“We use leather on almost every interior project we deal with,” says Eric Gillespie, Director of Flying Colours Corp.

“It is vital to use high-quality leather that is going to endure over time. We use quality aviation leather suppliers that understand the market and the installation and burn certification requirements.”

*“Customers want the comfort, space, and feel of their homes”*

M&R Associates A350 interior design





*The importance of fabrics and finishes to the feel of your aircraft is vividly illustrated in these concepts from AirJet Designs. Using the same structural elements, AirJet Designs has created two vastly different interior spaces. The Xin Ge private jet cabin concept (above) uses materials and colours that are designed to appeal to AirJet Designs' Chinese clients while the Art de Vivre concept (below), which is very sharp in its lines and colours, is designed to appeal to a European audience.*



Images courtesy of AirJet Designs



## Colour Selection

Though certification and craftsmanship generally make up the bulk of an interior's cost, the material costs (particularly exotics and bespoke patterns) are far from trivial. Consider using the less-expensive leathers in the non-wear areas of furniture, such as the accent panels or outside of a chair back. You can usually match them to an expensive hide or use contrasting panels of a substitute material. Though leather will wear, it looks natural while doing so and, unlike fabric and carpet, properly conditioned leathers don't readily absorb smells. Leather's own scent is generally considered pleasant.

Colour selection is important. Though finished leather can be virtually any colour, the more-natural tones wear best and are easier to match. They are also easier to sell when the time comes – few buyers will be interested in maintaining your aircraft's corporate colours and logo-embellished tapestries.

## Cleaning All-important

Pay attention to the surface feel of your leather, as well. Though an oily surface may feel good, it may also attract dirt. A silky finish is easier to wipe clean with a dry cloth. Leather providers all offer advice on cleaning. "Leather is generally easier to clean when compared to a fabric," notes Gillespie. "This will help it last over time."

Michael Ross of Coast to Coast explains that hides can be selected on an 'A-B-C' basis: with A being good all over, and B being useful in non-wear areas. (C leather makes good shoe soles.) Ross warns that bleach and ammonia can quickly remove leather's emulsion, aging it quickly and degrading its colour. Sun and water are formidable enemies of leather. Even some perfumes, in close proximity, can adversely affect the material.

"An aviation designer will know what will work," notes Callies. "That doesn't mean your ideas should look stale. Look at other disciplines – yachts, motor homes – for inspiration, but use an aviation designer and a dedicated specialised aviation house for the work." ■

## Luxurious Flying Carpets

"The traffic patterns in aircraft are rigid once they're laid out," says Tim Callies, Head of Creatives at Comlux. "You have to consider the wear paths, sound, and what temperature changes do to the dimensions of various parts of the structure and interior. It's not an environment that will be kind to a residential carpet."

"Your most-frequent destinations also matter. Saudi Arabia and Russia are very different. For carpets, particularly in entryways – you need to understand what will be on peoples' shoes. Will it be water, or sand, or maybe salt? Do you need custom shoe storage?"

"The most critical component of aircraft interior design is hiring a competent [aviation] interior designer," says Michael Ruggeri, President of the Scott Group (USA) which makes stock and custom carpets (including the carpet in the Oval Office of the White House). "They see things in the macro sense, so they can create the synergy of suppliers that complements you."

Scott produces its carpets from 100% New Zealand wool, which Ruggeri says can be dyed to: "...the cleanest, crispest colours; it wears well and it's easy to clean." Scott can produce super-high density carpets in unlimited patterns. "A good carpet never wears out," says Ruggeri. "It gets replaced because of poor cleaning and maintenance." Match your carpet's general tone to the theme of your aircraft, but mix in additional complementary colours. "They help mask the inevitable tiny stains."

Cut pile has a luxurious look, but immediately shows vacuum tracks and footprints. A loop pile will show less. A carpet pad can extend carpet life. Ruggeri notes that it adds a little weight and reduces stand-up height, but these are small considerations.

It is industry practice to furnish two sets of carpets, so that one can always be clean and at the ready. Ruggeri recommends frequent vacuuming and rotation with the spare carpet as often as three times a year. During the rotation, the main carpets can be properly spot-treated and cleaned. "Don't go from a cleaning ritual to a restoration," warns Ruggeri.

Carpet runners that can be stowed during flight can be useful, particularly when the airport is wet, sandy, or dirty. And don't skimp on carpet - even when it may cost upwards of €800 a metre and you need two sets. "Put it in perspective," says Ruggeri. "Your airplane costs \$2 to \$60 M, and there is nothing you notice more than your carpet."

For high-traffic and wet areas, Eric Gillespie of Flying Colours Corp recommends using stone floors by List: "The floor is made of real stone and comes in numerous colours and patterns. It is milled down to 2 mm thick and attached to a composite panel to provide a lightweight product that passes all necessary testing. It is easy to clean and will last forever." Flying Colours have already installed the floor in a Global Express refurbishment project and plan to fit it in a Challenger interior soon. ■

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*It is industry practice to furnish two sets of carpets*