

Textiles for the air

Lantal Textiles has its roots in a small linen business that sold cloth to nearby Emmentaler cheese makers. Today, its customers include over 300 airlines as well as all leading aircraft manufacturers, and some of the more luxurious products find their way onto VIP aircraft and the occasional superyacht. The carpets and seat covers for two iterations of America's Air Force One came from Lantal production in the small Swiss towns of Melchnau and Langenthal.

On the top floor of a classic industrial hall in Melchnau, large swaths of backing fabric are stretched between large wooden beams. Men with pneumatic tufting guns walk along these pieces of cloth, at an even, steady pace. They are using air to shoot loops of yarn into the spaces between threads in the cloth, tufting rows in custom carpets.

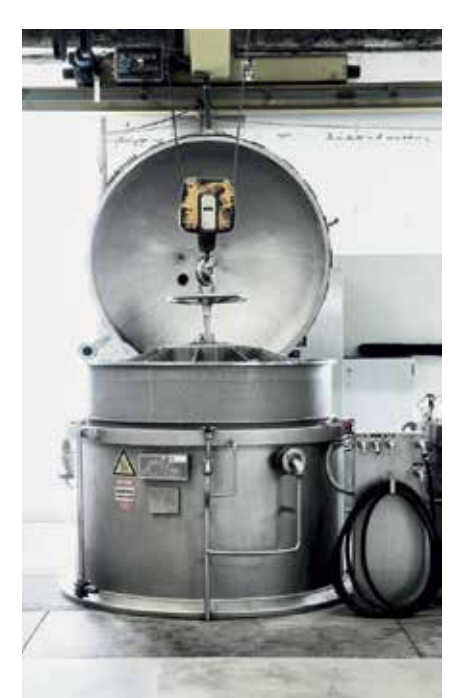
These are Lantal's most luxurious carpets, usually made for aircraft. The customer chooses the materials, such as wool, silk, synthetics or even Lurex, which is yarn with strands of metal. These strands are usually aluminum, but they can be gold.

Customers select a shape and design for the carpet. The design is beamed onto the cloth and traced with a pen.

To avoid carpet seams, the company sometimes creates the full carpet for an aircraft in one piece, with cutouts for furniture and appliances. At other times, this is not possible. The workshop has done carpeting for Boeing 747s, and in these cases it is necessary to go with multiple segments.

The production space is large enough to make a carpet almost 30 meters long. If that carpet were 10 meters wide, it would weigh about 1 ton and be very difficult to handle. The length of the carpets is therefore usually limited to 15 meters or less.

After the tufting is completed, a backing is added for stability. The carpets are then draped over a huge rectangular table, and their surface is evened out by hand. Designs can also be cut into the carpet this way.



Hand tufting with a pneumatic tufting gun (top left). A wide range of colors, created in-house (top right). Lantal production in 1954 (bottom right). The carpet-colors lab (bottom left)



Lantal uses 190 pigments to create 10,000 dyes.

The room is quiet and airy. It stands in distinct contrast to the main carpet manufacturing hall next door. The hall is a place of noise, bright colors and large machines.

As the industrial looms weave carpets, thread and yarn are fed in from thousands of spools. This results in angular streams of beautiful colors.

Lantal makes a variety of textiles, including seat covers, curtains, wall coverings and carpets. These products not only go into aircraft, but also trains, buses and yachts. Along with selling textiles, the company can install them and provide a variety of consulting services.

As it advises clients, Lantal can draw from expertise gained over a long history. After the 1886 start with linen, the company began making textiles for furniture. In 1954, a sales representative went to the Dutch national airline,

KLM, to try to sell it some fabric for its office chairs. The airline did not want fabric for the chairs, but it did want some for the seats in its airplanes.

Having discovered this market, the textile-maker then approached other airlines and began to develop a field of expertise. In 1956, it made an acquisition to move into railway and bus textiles as well.

At the time, the company was called Möbelstoffweberei Langenthal. In 1996, as it was becoming increasingly international, it changed its name to something easier for the world to pronounce, becoming Lantal Textiles. In 2004, the CEO Urs Rickenbacher and other senior executives bought a majority stake from the founding family and limited the scope of the company's business, focusing exclusively on transportation textiles.

MODERN MANUFACTURING

In the production hall, the carpet looms are in rapid motion, as yarn is whipped into place. Weaving takes time, however, as a sturdy product is created from these light lines of thread and yarn.

Each loom produces about eight square meters of carpet per hour. There are two common widths for the carpet: 200 cm for Airbus and 252 cm for Boeing.

Lantal spins its own wool, at a nearby subsidiary. It also dyes it, using 190 pigments to create 10,000 dyes. Freshly dyed yarn sits in large metal vats, radiant with deep, rich color.

Each year, Lantal uses over 500 metric tons of wool, almost 10 tons of man-made fibers and more than 200 tons of blended yarns. The more upscale the textile, the more wool it is likely to contain. Wool is not only beautiful but also pleasant to touch and comfortable underfoot. It has a naturally low flammability.

Almost all carpet is woven to order. To set up for a job, all of the spools of thread must be put in place and the ends must be pulled into the loom. This can take up to one-and-a-half days.

After carpet leaves the loom, it runs by a quality controller who fixes small irregularities by hand. The controllers have a chair that is mounted on a rail, and they slide from side to side, both visually inspecting the carpet and running their hand over it.

The carpet then goes through a machine that coats and bakes the back. This coating will give it a stiffness and keep yarn from coming loose. It also has fire-resistant properties.

Often a fire-retardant coating is also put on the textile as a whole, and sometimes it is put on the yarn before weaving. Creating textiles for aircraft is a technical endeavor.

FOR SAFETY'S SAKE

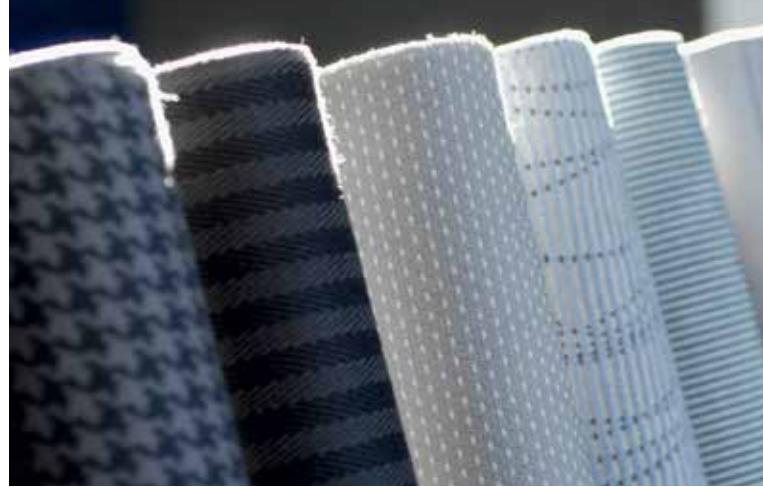
"If you see something that you like," says Leonore Kratsch, who works in Lantal's development department, "you start with the most important test – the 12-second vertical flammability test."

The development and design teams at Lantal are always on the lookout for interesting materials. They want something attractive that will also hold up to the rigors of passenger transportation.

When the team members see something they like, they usually have to sit down and figure out how to make something similar that has the necessary safety characteristics. This usually means switching out some or all of the materials.

To make sure the product stands up to requirements, Lantal has its own in-house testing lab. In addition to tests for flammability – which include an impressive test in which a long 1,000 degree flame is held to a textile-covered

Seat burn test: A 1,000-degree flame for two minutes (left). Lantal textiles for aircraft interiors (top and bottom right)



Aircraft seat with Pneumatic Comfort System technology (top left). Pneumatic seat cushion (bottom left). Bill Clinton on Air Force One (top right). Lantal textiles on the seats of a Boeing BBJ aircraft (bottom right)

The remaining players in the Swiss textile industry usually focus on innovation and technology.

foam seat cushion for two minutes – the lab tests for toxicity, smoke density and heat generation. Many of these tests are offered to third parties as well, and Lantal can issue European Aviation Safety Agency (EASA) certificates.

To make sure the materials can handle the rigors of transportation, the lab also tests for pilling, wear, abrasion and colorfastness. In one machine, a round piece of newly developed material is rubbed repeatedly with another material, simulating the effect of the long stream of passenger clothing that will come in contact with a transportation seat.

Kratsch says that a mix of wool and polyamide tends to preform very well in these tests. For commercial aircraft,

the fabric that is used will depend on how an operator plans to clean its textiles, as well as what kinds of flights it will be offering. Short-haul flights, where a plane is being filled and emptied several times a day, are tougher on textiles than long-haul flights.

DESIGN

For those flying in an aircraft, it is design and comfort that draw attention. Lantal sends a team to trend fairs, such as those in London and Milan, to see what is happening. Along with an awareness of color, style and materials, the company monitors “megatrends.” At the moment, some of these include sustainability, an aging population, digitalization and globalization.

Each year, Lantal puts out a collection, as well as a trend book that uses images to communicate the mood and thoughts behind its designs. Only a small percentage of clients order di-

rectly from the collection. Designer Marianne Günter says some of the clients who do so are “those who are a little braver.” Some parts of the collection can be quite colorful. She says there are some regions that are more likely to embrace bright colors, and that small airlines are more likely than larger airlines to order this way.

Most clients use the collection as a starting point. “They often say, ‘I would like this, but a little different,’” explains Günter. “Maybe they want a different color or other materials. Sometimes it is a slight modification of the design.”

Several Lantal hallways are lined with displays of the color and style combinations that have been created for various airlines. A few other hallways, and some hidden office corners, are filled with packages of samples. Lantal creates a lot of samples as it competes for contracts. Günter says the pressure to be quick when creating samples has been increasing.

Luckily for Lantal, it manufactures its own samples, which gives it an advantage under time pressure. The company benefits from its strong industrial base.

Textile production was the dominant industry in Switzerland in the 19th century, bringing wealth and international recognition. The industry struggled off and on in the 20th century, before declining. Today, it has all but disappeared, with the cost of labor in Switzerland among the highest in the world. The remaining players usually focus on innovation and technology.

Lantal was chosen to provide textiles for Air Force One as it was outfitted during the presidency of George H. Bush, and then again under Bill Clinton. The company has recently collaborated with Etihad Airways Engineering to open the first flammability test laboratory in the Middle East. Lantal has its niche and it continues to expand internationally.

SITTING ON AIR

The former Lantal CEO, Urs Baumann, went to an innovation fair in the early 2000s and sat on a bench with air cushions. It occurred to him that a similar principle might be a great idea for aircraft seats.

Lantal has since created the Pneumatic Comfort System (PCS). The seat cushions are made of air encased in polyurethane foil, which is then wrapped in Nomex

and Kevlar fabrics to protect it from fire and puncture. Use of these cushions can reduce the weight of a first-class seat by up to five kilograms.

A pump and several valves control the air pressure in the cushions. Passengers can choose a seat firmness, and the seat makes automatic adjustments based on the ambient air pressure. The cushions can also provide an air-pulsing massage.

The system is being used by 15 airlines. It is currently only made for first class and business class, largely because of its relatively high installation costs. The seats are also found in VIP aircraft, and a custom version was used in Solar Impulse, the single-pilot solar airplane that flew around the world. In this small cockpit, the pilot was sometimes in the seat for several days at a time.

VIP COMFORT

Taking Pneumatic Comfort System technology to a whole new executive level, Lantal produced an air cushion mattress for an aircraft outfitted by Jet Aviation. The textile maker has also provided carpet, fabrics and leather for several wide-body and narrow-body aircraft that were completed or refurbished at Jet Aviation Basel.