

Genuine leather

Aircraft



Preface

Dear Reader,

Thank you very much for your interest in Lantal and our company's genuine leather products. As a leading provider of all-in-one interior solutions for the international community of aircraft, railway and bus operators as well as business jet and superyacht owners, Lantal has an excellent global reputation not only for creative textiles but also for premium leathers. Leather is a natural, emotionally evocative material which has been used for countless applications since the dawn of humankind. The exquisite beauty and true naturalness of genuine leather is an impressive and important design element in aircraft interiors. When you kick off your next cabin project, let us show you how to achieve the ultimate in well-being for passengers. You can unconditionally trust Lantal's competence in the domains of style, design, completion, and cost-effective

project management. Our know-how in fabricated leather seat covers is just one of the assets we contribute to a customer relationship.

We hope that this publication will serve you well with the detailed information it provides regarding all aspects of our fully airworthy leather grades, design options, conversion services, packaging and shipping, technical data, and cleaning recommendations.

If you have any questions or requests, please do not hesitate to contact the Lantal team at any time. You will find the contact addresses at the end of this compendium.

Yours truly,

Dr. Urs Rickenbacher
Partner, Delegate of the Board
Chief Executive Officer

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1

Lantal's design competence

Nothing influences the personal well-being of an airline passenger as directly as the ambiance of the aircraft cabin. And hardly any other company in the industry is as creative in addressing the needs of passengers as Lantal with its decades of experience in planning and designing atmospheric airborne interiors.

The Lantal design team constantly explores the worlds of architecture, fashion, and furnishings in a quest for new megatrends that inspire fresh and differentiating cabin interior solutions. The team's focus is on themes, patterns, color combinations, textures, visual metaphors, and style elements which capture the zeitgeist and reflect the era's contemporary preferences. The results of these analyses are translated into interior concepts enriched with the culture, heritage, and livery of each customer to create a one-of-a-kind travel experience. Every single soft cabin solution developed by Lantal projects the airline's corporate identity and brand touchpoints in subtle or persuasive ways. This brochure puts the focus on leather in the interior design continuum. With our three qualities, the 48 standard colors and countless custom shades, the refinement options, and Lantal's proven design competence, the possibilities of using leather in your aircraft are virtually endless.



2 Leather

In the design continuum, leather occupies a special position. Historically, alongside stone, wood, cloth, and parchment, leather ranks among the most important materials that shaped the evolution of our society. Countless generations are familiar with leather objects ranging from pouches, suitcases, saddles, seats, shoes and leather-bound books to gloves and jackets. Leather is omnipresent, especially in fashion, where it adds a touch of exclusivity to any outfit. The same applies to leather in aircraft cabins. Whether used sparingly as trim or as the dominant upholstery material in a cabin section, leather is endearing, and you can count on Lantal for giving it prominence in your cabin. Leather is the tanned hide of animals. Because of their individual patterns of pores, scars, surface structure, and creases, no two hides are quite the same. All of these features are evidence of genuineness. Real leather is skin-compatible, and agreeable to touch. It always has a pleasant perceived temperature: in the summer, it cools, and in the winter, it warms. Unlike any other material, it is soft and supple but at the same time durable and tough. Lantal genuine leather withstands wear, retains its shape, and is resistant to perspiration, water, and oil. Lantal genuine leather is sourced mainly from Central European cattle hides.

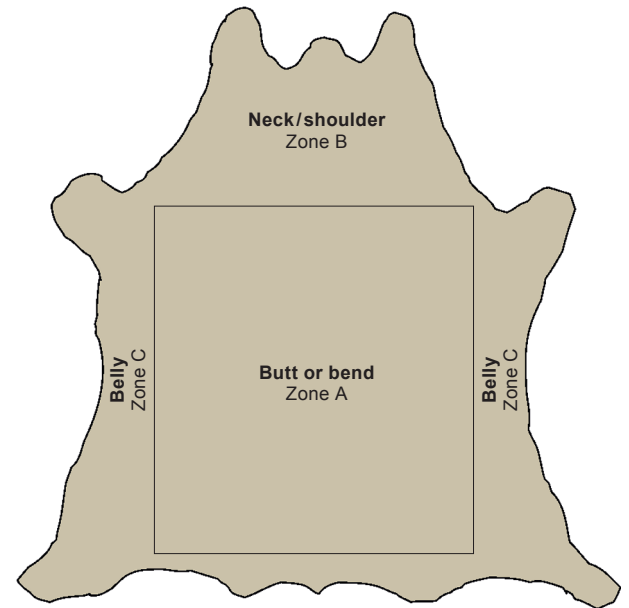


3 Hides

3.1 Parts of a hide

For anatomical reasons, the density of the fiber structure and thus the resilience of genuine leather will differ considerably within a single hide and certainly also across multiple hides. This must be taken into consideration when the hide is overlaid with the configuration of the seat cover parts.

Structurally, a distinction is made between the neck and shoulder, butt or bend, and belly zones. Each of these zones is ideal for specific seat parts, so the entire hide can be used for crafting upholstery elements. The central part of the hide, referred to as zone A, is characterized by very strong and densely arranged fibers. The neck and shoulder part, zone B, has a less dense fiber structure and exhibits visible creases. Finally, the fibers of the belly parts, zone C, have the least density, so these hide parts are not picked for components that are exposed to mechanical stress.

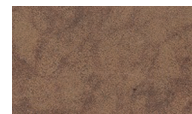
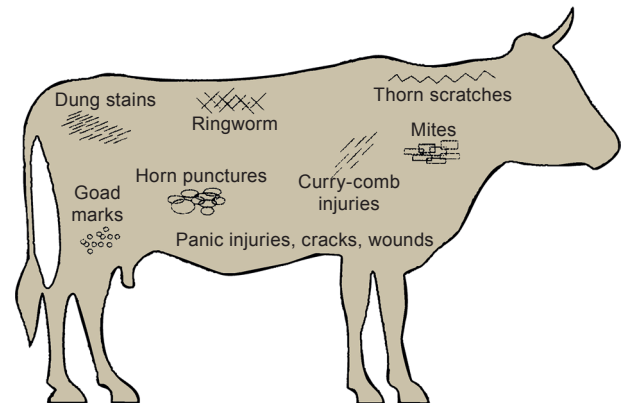


3.2 Natural product with characteristics

Leather is a natural product and its origins show. Every single hide has its very own history. Leather always exhibits traces of each animal's past life.

The surface of the leather is often characterized by features such as fat wrinkles or tick bites. They are hallmarks that verify the authenticity of the leather, and because they do not influence its quality or service life are not considered defects in the conventional sense of the term.

The marks portrayed on the right are among the natural manifestations that cannot be judged as non-conformance with customary quality standards. When cutting the hide, of course, every effort is made to avoid prominent or unsightly markings on parts ultimately used for the exposed surfaces of a seat.



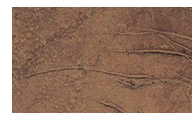
Dung stains



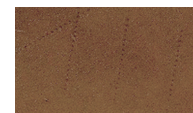
Goad marks



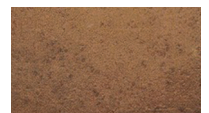
Horn punctures



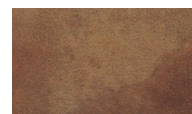
Thorn scratches



Curry-comb injuries



Tick bites



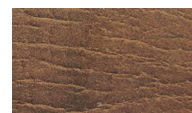
Putrefaction



Sores



Scars



Fat wrinkles



Branding marks

4 Leather production

Leather production is based on a complex series of processes. The elaborate path from the rawhide to leather involves numerous steps and procedures. The preparatory stages alone can include 10 different processes. This is followed by tanning as the crucial conservation step and then by an extensive set of finishing operations that determine the material properties of the leather.

Preparation of hides for tanning

The first steps in a tanning facility take place in the beamhouse. Intensive soaking processes prepare the hides for the actual tanning operation. Big barrels or heavy-duty rotating drums that resemble washing machines are used for these wet processes. The hide is unhaired and its fiber structure softened with lime and sodium sulfide. In this phase, the hide is also split into two horizontal layers. This thinning operation yields a leather of uniform thickness. The top layer of the leather is referred to as the top grain quality.

Tanning

The key process – tanning – takes place in the second phase. It involves permanently altering the protein structure of the hide with a tannin to permanently prevent the decomposition of the skin. The tanning process strongly influences the leather's attributes such as durability, elasticity, breathability, and hardness or suppleness.

Lantal genuine leather is tanned using the wet white process. No chromium sulfate is used in this process.

Dyeing and lubrication

The third sequence of steps imparts color to the leather. The hide is dyed in large, rotating fulling mills. The process relies on the same types of azo dyes that are also used for textiles. These water-soluble pigments soak into the leather and thoroughly bind with the collagen proteins. This gives the hide its basic coloration. Very slight color variations within a given hide cannot be avoided. Leather is often oiled to improve its water-resistance in a separate process that supplements the natural oils that it already contains.

Finishing

The final operations transform the hide into an end product with outstanding added value. The leather surface is modified for visual appeal, for instance by buffing, glazing with a pigmented varnish or adding a grained pattern. The finishing effects can be tailored to the customer's needs. The objective, apart from the look and feel, is to achieve long-lasting protection of the leather against wear and tear.

5

Lantal's leather portfolio

The selection of leather grades available from Lantal covers the entire spectrum of customer expectations with respect to durability requirements, color preferences, and value-adding design options for compliance with corporate identity guidelines.

5.1 Qualities

The Lantal leather portfolio consists of three qualities with distinctive surface textures: Classic, Crescendo, and Conbrio.

Classic**Article 9361**

Thanks to its fine, smooth surface, Classic has a very stylish and elegant look and feel. With its suppleness and soft glow, it emphasizes the magic of sleekness. Classic is 1.1 mm thick. This long-life natural product owes its round hand to the pleasant fullness of the fiber structure.

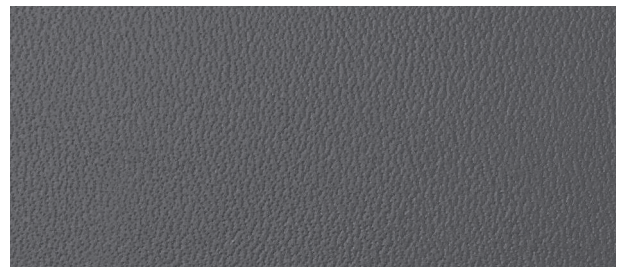
Weight ($\pm 10\%$ tolerance) 800 g/m², 23.6 oz/sq.yd.

Thickness (± 0.1 mm tolerance) 1.1 mm, 0.043 in.

Average hide size (approx.) 5 m², 53 sq.ft

In a nutshell

Classic is a cool, easy-care technical leather, both visually and to the touch.



Crescendo**Article 9549**

The surface of Crescendo reveals the authentic structure of the hide, accenting the beauty of natural leather. With a thickness of 1.1 mm, it has a soft hand and exhibits excellent functionality. A special process with a balanced varnish finish makes Crescendo a hardwearing, easy-to-maintain upholstery material that preserves the natural traits of genuine leather.

Weight ($\pm 10\%$ tolerance) 800 g/m², 23.6 oz/sq.yd.

Thickness (± 0.1 mm tolerance) 1.1 mm, 0.043 in.

Average hide size (approx.) 5 m², 53 sq.ft

In a nutshell

Crescendo is a naturally structured leather with a persuasive look and feel.



Conbrio**Article 9543**

The balanced depth and intensive structure of Conbrio emphasizes the expressiveness of leather. The refined surface manifests longevity and character. Conbrio guarantees a precision cut and is wear-resistant. It is 1.1 mm thick and despite processing preserves a soft hand. Available for large-volume orders only. The minimum quantity depends on the application.

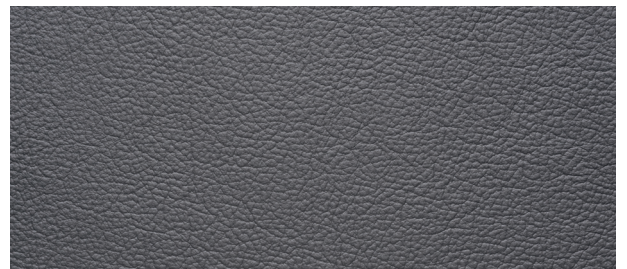
Weight ($\pm 10\%$ tolerance) 800 g/m², 23.6 oz/sq.yd.

Thickness (± 0.1 mm tolerance) 1.1 mm, 0.043 in.

Average hide size (approx.) 4.8 m², 51 sq.ft

In a nutshell

Conbrio is the best choice for large-volume projects.



5.2 Design options

As is the case with textiles, leather can be customized in many ways to reflect your corporate identity, for example with perforations, dimples, embossed logos and patterns, and even embroidery.

Perforations

Perforations give leather a fresh, breathable look. They are punched all the way through the hide. Lantal's perforation options A1, A2, B1, G1 differ in hole size and hole pitch. Even though the perforation removes some leather, this does not affect the hide's tear resistance. For technical reasons, hides must be halved before they can be perforated. Customers will therefore receive hide halves.



Dimples

Dimpling is another attractive design option. The holes are semi-perforated and do not extend through the full thickness of the hide. Lantal's dimpling hole size and pitch options are designated PR1 and PR2. For technical reasons, hides must be halved before they can be dimpled. Customers who order hides rather than ready-made seat covers will therefore receive hide halves.



Embossing and debossing

Hides can be customized with specific full-surface or partial-surface textures, patterns, or logos. The techniques available for such enhancements are embossing and debossing. Embossing represents pushing the design or logo up above the leather. Debossing is pushing the image below the level of the leather.



Embroidery and seams

Further design options are available to leverage your corporate identity. For example, your logo can be embroidered into the leather and contrast-colored yarns can be used for stitching the seams and piping. Please contact us for details on differentiation possibilities and custom design accents.

5.3 Colors

Lantal genuine leather is available in a broad palette of 48 charming standard colors in neutral, warm, and cool shades. These standard colors are displayed on our website www.lantal.com by clicking through Aircraft > Collections > Genuine leather > Collection > Classic/Conbrio or Crescendo. Custom and signature colors are available on request as well.

For the Classic quality the minimum order quantity are 25 m² per color. For Crescendo a minimum order quantity of 50 m² applies. The minimum quantity for Conbrio is considerably higher and depends on the application. Please contact us for an estimate.

Minor color differences between palette samples and dyed hides as delivered cannot be ruled out. While the deviations, if any, will hardly be perceptible, it is not possible to guarantee absolute color fidelity.



5.4 Technical features and specifications

Tanning

Tanning without chromium sulfate.

Dyeing

Dyed through with azo dyes.

Finishing

The surface is finished with a water-soluble pigmented lacquer, resulting in excellent fastness properties.

Flammability

Lantal genuine leather is permanently flame-resistant in accordance with FAR/CS 25.853 App F Part I and meets Airbus & Boeing specifications ABD0031 Rev. G / BMS8-87 for smoke and toxicity.

5.5 Test data

Color fastness to artificial light (Xenon)

Test method	Minimum requirement
ISO 105 B02	5

Color fastness to rubbing

Test method	Minimum requirement
ISO 11640	wet: 500 T./4 dry: 2000 T./4

Flex resistance

Test method	Minimum requirement
EN ISO 5402	100,000 flexes

Finish adhesion

Test method	Minimum requirement
ISO 11644	4 N 10 mm

Tear resistance

Test method	Minimum requirement
ISO 3377	25 N

Flammability test

Test method	Minimum requirement
FAR 25.853 App F Part I	passed
Vertical	

Smoke density

Test method	Minimum requirement
ABD 0031 Rev.G/BMS8-87	passed

Toxicity

Test method	Minimum requirement
ABD 0031 Rev.G/BMS8-87	passed

6

Executive summary

Lantal genuine leather unites many beneficial product features and advantages:

- In cabin interiors, leather confers an image of luxury, exclusivity, and elegance. The exquisite beauty and true naturalness of genuine leather is an impressive and important design element in aircraft interiors.
 - Leather is a natural material which is permeable to air and moisture; it is supple and soft, warm and flexible, and very durable.
 - Design options such as embossed or debossed logos as well as Lantal's broad selection of colors make leather highly adaptable to your livery and corporate identity.
 - Leather is maintenance-friendly. It is easy to clean, simply by wiping the surface with a moist cloth.
 - Leather is hygienic. Dust and dirt remain on the surface and can be wiped off easily.
 - Longer service life. The natural beauty of the leather is preserved even after years of use.
-

7

Fabrication

7.1 Single-source convenience

As a provider of all-in-one interior solutions, Lantal can deliver leather for any phase of the logistics chain, from hides and half hides for the cut-and-sew process to fully fabricated seat covers that match the livery and branding of the airline.

The status as Design Organization (DOA) officially authorizes Lantal's subsidiaries ASI and ACC to design ready-to-install products for aircraft interiors. As an approved Production Organization (PO, EASA Part 21 G), Lantal is authorized to manufacture parts according to approved design data and to ship them with an EASA Form 1. This includes precision-cut and sewn leather for seat and headrest covers as well as armrests and footrests. Our turnkey design competence simplifies project coordination and makes the completion process more cost-effective. As a Lantal customer, you benefit from single-source convenience, greater cost-effectiveness, and sustainable solutions aimed at the ultimate in well-being for airline passengers. To eliminate the bottlenecks often associated with multiple-supplier concepts, the fabricated seat cover is no doubt the most economical solution. We work on the basis of approved seat data, drawings, or samples of current items and deliver professionally cut and assembled products. Our finished seat covers are ready to fit and easy to install. Compliance with all airworthiness requirements is also guaranteed, because only one supplying party is involved. Moreover, each shipment can be accompanied by an EASA Form 1. Lantal is certified to EASA 21 Subpart G, and is thus authorized to provide an EASA Form 1 with every delivery of ready-made products.

7.2 Structure zones of the hide

Cutting hides into seat cover parts can be a complex procedure. On the one hand, it is desirable to maximize the yield of each hide in terms of usable parts. On the other, care must be taken to eliminate the occurrence of prominent scars and bite marks on the most visible portions of a seat. For this reason, there is no single

cutting template that will apply to all hides.

For the fabrication of finished seat covers, Lantal uses all parts of the hide:

Structure zone A – Butt or bend

This part of the hide had to carry most of the weight of the animal's body. Therefore its fiber structure is extremely dense and tough. As the most valuable part of the hide, the bend is used for those upholstery parts of where the greatest strength is required.

Structure zone B – Neck and shoulder

The neck/shoulder area is less densely fibered and exhibits surface creases that were caused by the movement of the animal's head. Nevertheless, the neck/shoulder area is ideal for applications where strength is required. In addition, this zone shows a very distinctive natural characteristic: fat wrinkles.

Structure zone C – Belly or flank

The belly part bore only little of the animal's weight. Thus, the fiber structure was hardly stressed and is therefore fairly slack. For this reason, the belly zone is used where the strength of the leather is not a critical parameter.

7.3 Fabrication details

Every aircraft seat model has a detailed pattern blueprint that splits the finished seat cover into individual parts which must be cut out of the hide and then sewn together in the assembly process. The flat hides are laid out and the upholstery parts are tightly puzzled under consideration of the structure zones in topographically optimized arrangements. Depending on the seat model, 5 to 15 cut hide parts must be assembled per seat cover.

The following illustrations show which structure zones (A, B, or C) of a hide are used for the individual parts of a seat cover.

The following seat components are fabricated with zone A parts of the hide:

-
- The entire visible front area of the seat and back rest.
 - The front of the headrest.



-
- Outside surface of literature pocket.
 - The area at the rear of the backrest that is visible when the food tray is deployed.
 - The top rear area above the rear-mounted food tray.

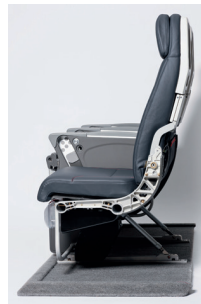


-
- The top area of the seat back and of the headrest.



The following seat components are fabricated with zone B parts of the hide:

-
- Lateral parts of the seat and back.
 - Lateral parts of the wings.



-
- Outside of the literature pocket wedge.



The following seat components are fabricated with zone B or C parts of the hide:

-
- The back side of the wing assembly.



-
- The area behind the headrest on the dress cover.



-
- The area behind the headrest on the dress cover and the back of the wing.



The following seat components are fabricated with zone C parts of the hide:

-
- Inside of the literature pocket including the insides of the inserts.



-
- The flaps on the underside of the cushion.



8 Packaging

Hides are packaged in boxes with a length of 2.45 meters. Each box can accommodate up to 10 hides. To minimize the risk of folds caused by packaging, the leather is rolled onto cones from tail to head. There are two hides on a cone and five cones per box. The cones are individually wrapped in plastic film.

Folds, if any, can be eliminated with warmth and by stretching. The hides should be warmed to max. 50 °C (122 °F) either in a warm room or with a hair dryer. The leather must be stretched while it is warm and then allowed to cool slowly.

Each box is labeled with the following information:

- Article description
- Box number/forwarder/delivery address/
purchase order number
- Total number of hides and total square meters per
shipment
- Total net and gross weight per shipment

Storage

Over time, due to its natural characteristics, leather can show some ageing - meaning that the color of leather can change slightly over time. Therefore the maximum storage period for leathers should not exceed 6 months provided that the products are stored in accordance with the mentioned conditions.

If the leather is stored longer than 6 months, Lantal recommend repeating the color inspection.

Whenever possible, remove the leather hides out of the original packaging box during the receiving inspection and staple the hides on a tubular horse frame. Otherwise, store in small stacks laid out flat on wooden pallets. Never store directly on floor, along walls, or in front of heaters or other heat sources. Boxed leather hides should be unrolled and laid flat on a table or hung over a frame at least one day before cutting. This allows the leather to relax.

9 Leather care

Thanks to the judiciously applied finish, leather only needs occasional cleaning with soapy water, followed by wiping down with clear water. No cleaning agents must be used on genuine leather upholstery. The natural beauty of the leather is preserved even after years use.

Lantal genuine leather is treated with a light coat of tinted varnish to enhance the functionality of the leather, making it lightfast, water- and oil-repellent, and permeable to water vapor. Do not use any unapproved chemicals! Never use PE micro fiber fabric on leather or synthetic leather, as it could damage the leather surface.

Dry cleaning

For regular care, dry clean the leather with a dry cotton cloth unless stained. If stained make a deep cleaning intervention following the steps of the main cleaning process.

Main cleaning

For main cleaning, we recommend the use of a mild soap solution applied with a sponge or a soft cotton cloth. Then wipe off the soapy water with fresh water and dry with a soft cotton cloth.

Stain cleaning

This is a deep cleaning intervention using special-purpose cleaning fluids for leather. Wet a sponge with the cleaner and clean the leather with circular movements. Don't rub! Dry gently with a clean cotton cloth and let dry for at least 30 minutes.

Lantal recommends the exclusive use of "Leather Master" cleaning products because these products have been tested on Lantal genuine leather.

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Complementary information

10.1 Quality inspections

Lantal genuine leather is a high-quality product that complies with strict airworthiness requirements. When inspecting leather, please bear in mind that leather is a natural product, and each hide may be slightly different. Hides will always exhibit natural marks like tick bites, etc., and their fiber structure will vary from zone to zone and also within zones.

10.2 Service life

Basically, leather upholstery has a service life of approx. 6 years. The specific lifetime of soft cabin interior components depends largely on the airline's interior philosophy (colors, quality), passenger profile, routing (short-haul or long-haul), geographical routes, load factors and cleaning attitudes. It is therefore not possible to accurately project or guarantee a specific service life.

10.3 Guarantee

Complaints, if any, shall carry out as visual inspection of damages, completeness and defects of the deliveries must be submitted to Lantal within five working days in writing. Otherwise general terms and conditions from Lantal Textiles AG are in force. Once the products have been processed and cut, Lantal cannot accept complaints.

The warranty period is 24 months beginning with the delivery of the goods at the buyer's premises.

In the event of legitimate quality complaints, we shall remedy the defects or supply replacements free of charge within a reasonable period of time. No other claims for damages shall be accepted. In particular, the buyer explicitly waives any claims for damages not directly related to the delivered goods, including production downtime, usufruct losses, lost profits or revenue, as well as incidental or consequential damages of any kind.

10.4 Environmental statement

Lantal genuine leather qualities are REACH-compliant.

11 Contact addresses

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Notes
