



 **lavalan**[®]
THE WOOL INSULATION



Dear reader,

being a passionate mountaineer, I have learned that endurance will always be rewarded. Whether I go on ski tours in winter or mountainbiking in summer: No matter how exhausting the climb, the view of the surrounding landscape always more than makes up for all the efforts. This is to say nothing of the buoyant descents in powder snow or the fast downhill rides on the single trails.

Sportswear made of synthetic fibres was considered great progress when I was younger. However, it didn't take many mountain tours for me to realise that wool would be a lot better. The natural fibre perfectly regulates temperature and clamminess. It keeps the body warm and at the same time is a pleasure to wear.

Our family business has been processing wool in Germany for four generations. We have gained comprehensive experience with this sustainable raw material in over 100 years.

The mattress and bedding industries were the first to value our knowledge and enquire our products. As time went by, my brother and I had the idea to develop a woolen filling which warms the outdoor athlete under any conditions, yet is functional and washable as well. We called this product lavalan, which is derived from the Latin term 'washable wool'.

The first jacket we lined with lavalan was so thick it could have easily brought an Eskimo through the freezing arctic winter. Together with leading outdoor brands we have perfected our product and discovered that our woolen wadding can be much thinner and lighter compared to synthetic fibres and still provides perfect protection from cold.

In this brochure we have summarized the most important facts about the origin and characteristics of our wool. On top of that, you will learn more about the special features, the functionality and the know-how behind our lavalan.

Sincerely,



Friedrich Baur

A brief world history of wool

Our family business was founded in South Germany about a century ago. The 'Reiss-Wollfabrik Jacob Emendoerfer' commenced work in the Bavarian town of Dinkelsbühl in 1913. Over four generations we have constantly been learning what can all be made of wool. We are still newcomers though, considering how long people have been using this fibre.

Our ancestors perfectly knew that wool protects the body from cold so that it became survival wear. Ancient pictures from the Near East show that wool sheep with fur much finer than the one of wild sheep were already being grown 6,000 years ago. The Celts used to wear woollen coats over their linen shirts. In a Scandinavian moor, archeologists discovered a cloak made of wool web, which had warmed its wearer long before the Romans took power. Up to the modern era people clothed themselves in wool from head to toe, from their felt hats to their socks.

Far into the 19th century, it was still common to wash the wool directly 'on the sheep' and to not scour the shorn raw material. A day before the actual sheep wash, they soaked the dirty wool by herding the animals through the dammed up river several times, before leaving them to spend the night in their wet fur. On the next day the animals were shorn.

A major transformation happened in the second half of the 20th century when synthetic fibres replaced wool. Consequently, it became increasingly difficult for shepherds to sell their sheep's natural product. The only thing still in demand was the meat of their animals and, in smaller quantities, their milk, which was processed into cheese. Non-iron shirts of nylon fabric became all the rage and athletes were supposed to sweat in brightly coloured polyester shirts. Only the good old suit was still being tailored out of wool cloth.

A generation later we all seem to know better. Today the millennium-old raw material wool is going through a renaissance. Athletes exercising outdoors in cold temperatures have discovered that sheep's natural fibres are more effective than other fibres and that they feel more comfortable on the skin. Shirts, underwear and tees made of merino wool are becoming increasingly trendy. With our washable woolen filling Lavalan we have found a new approach by utilising the exceptional qualities of the fibre to create functional midlayer fillings. High demands for natural materials in the areas of living (mattresses, bedding) or building (insulation, acoustic panels) show that this trend reaches far beyond the clothing industry.

Shepherds and their herds came to Wasserstetten from far away between 1897 and 1948. Every year in spring, up to 20,000 sheep went through this washing process at the largest bath in southern Germany.

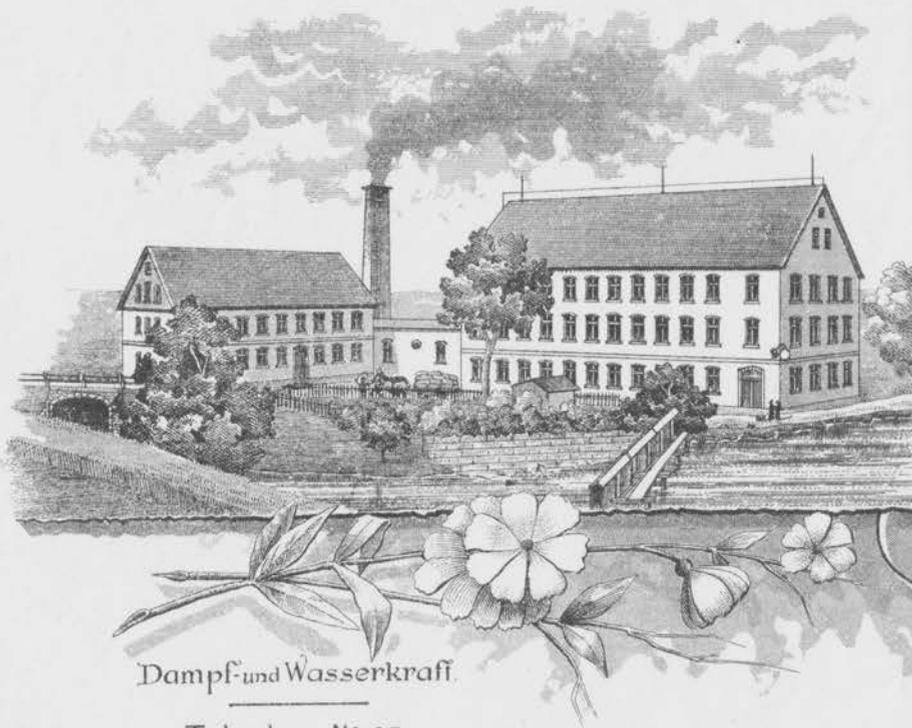


Photo: Walter Kleinfeldt, Tübingen (1927)



Photo: LMZ-BW / Hans Schwenkel (1939)

Letterhead from the 19th century of the old woollen spinning mill at the Walkmühle in Dinkelsbühl



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Dinkelsbühl, Den

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The historic Walkmühle, in which our company history began, is now a monument of industrial history. The mill used steam and water power to refine the fabric of sheep's wool. After four generations, the building still belongs to the Baur family. Today's production in the shape of a modern factory is located at the outskirts of Dinkelsbühl.



The wool fibre: natural high tech

A super soft, high-performance fibre with unique properties is the result of centuries of evolution and selective breeding. Ecological benefits, like biodegradability and renewability are a given. Of course there are more functional benefits for sport textiles.

Moisture management & breathability

The scientific term for 'breathability' is nothing else but moisture buffering. Tiny pores in the epicuticle of the wool allow vapour to pass through to the heart of the fibre. Wool can easily absorb up to 30% of its weight in moisture vapour, which makes the garment extremely breathable and the wearer less prone to clamminess.

Temperature regulation

Wool garments offer superior insulation and breathability compared to other fabrics of similar structure and weight. This insulation capacity has made wool synonymous with warmth, yet because wool is an active fibre, it also has a cooling effect on the wearer. Sweating generally serves the body's temperature regulation and has as a natural cooling effect on the skin's surface. Potentially, clothing can obstruct this process causing overheating. However, sheep wool's process of vapour transfer results in cooler muscles that are able to work at higher intensity levels, making it a far superior material compared to other fibres.

Insulation

As laboratory tests show, insulation values of wool outperform synthetic fibres by far when taking up moisture vapour along a certain period of time. There is a reason for this: When taking up humidity, the hydrogen bond of water is broken and chemically reacts with molecules of the wool to generate heat.

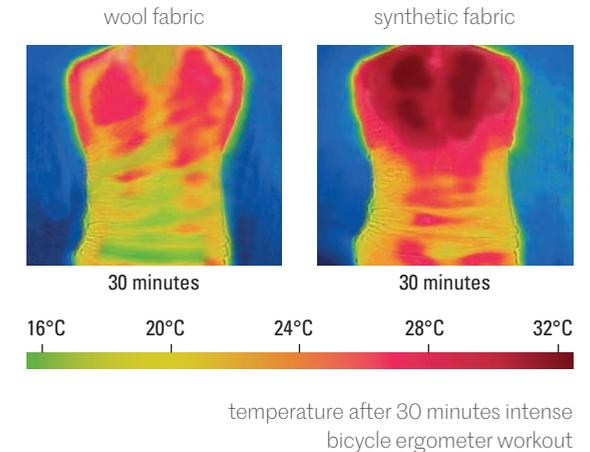
Odour resistance

Human sweat is odourless. What we know as unpleasant sweat odour only builds up over time as bacteria start growing on our clothes. Wool fibres wick moisture away so that it can never build up the bacteria that cause odour. Years of research have been wasted trying to recreate this process, which wool has done totally naturally all along. Consumers can feel comfortable being active outdoors and just spending long days at work or travelling without the risk of starting to smell.

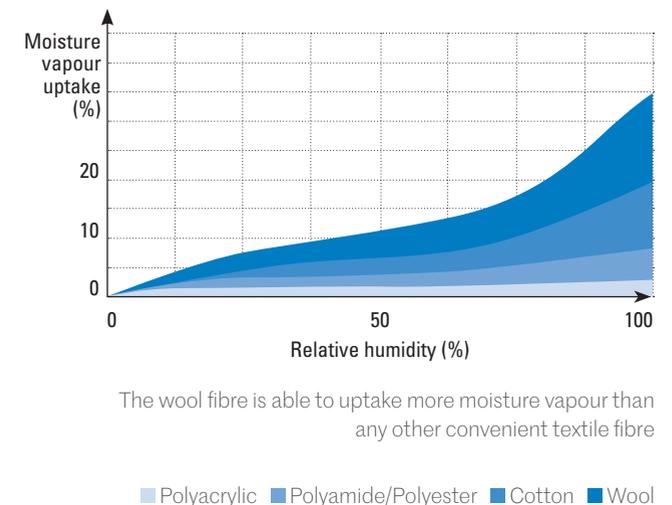
More benefits

Next to these high functional benefits, the wool fibre doesn't wrinkle and keeps its natural shape. It is very durable and can be bent more than 30,000 times before it breaks. The wool fibre has no allergenic potential nor it is harming health in any other way. On top, the wool fibre is antistatic and therefore has a reduced attraction to lint and fluff.

Temperature regulation



Moisture vapour uptake



lavalan[®]: crafted by nature

lavalan is a highly functional wool filling completely made of natural raw materials. It combines the unique properties of virgin wool with the easy-care features of polylactid (PLA) fibres.

Our 'washable wool' is a suitable insulation material for all types of textiles, from outdoor clothes to high street fashion, for example jackets, gloves and sleeping bags. It goes without saying that trousers, skirts or maternity wear can all be lined with it as well. The non-woven, which is characterised by its uniform and soft structure, can be processed and sewn in the same easy and uncomplicated way as comparable waddings. Fibre migration, i.e. puncture of the shellfabric an inner lining or moving fibres, is not an issue when manufactured properly.

The finished garment can be washed at temperatures up to 40 degrees. We recommend machine laundry in the wool wash cycle at 30 degrees using wool detergent only. Our wadding is made solely from renewable raw materials, which makes it 100 % biologically degradable. The 'Öko-Tex' certification ensures that lavalan meets the best possible ecological standard from manufacture to disposal. To guarantee this high quality standard we require the best raw materials. To put it briefly, not all wool is alike. The wool fibres we use must perfectly match in terms of fineness, length

and crimp. For that reason we only use the raw material from various European countries and give it to a fibre institute for precise examination.

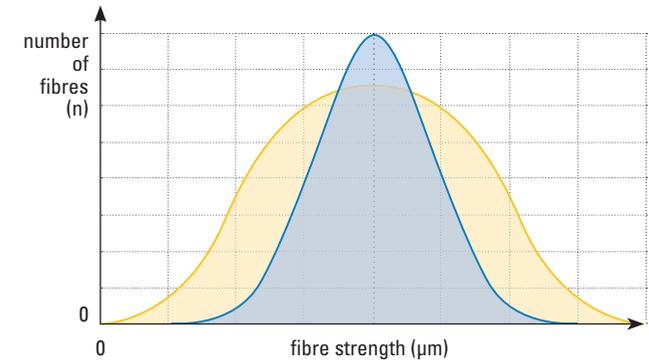
Fineness

A micron equals a thousandth of a millimeter and indicates the fineness of the wool fibre. The higher the micron value, the coarser the fibre. It is particularly important that the thickness of the fibres doesn't differ from each other too much. Wool fibres for lavalan are homogeneous, have perfect thickness and show no broadly diversified fibre spectrum.

Length and crimp

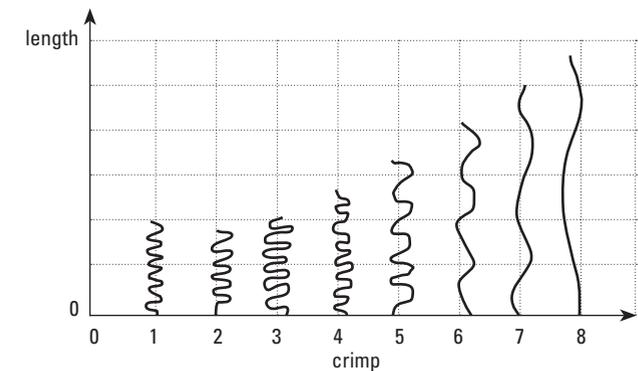
The crimping of the wool is the result of the fineness of the fibres, i.e. the finer the wool, the stronger its crimp. It is divided into high (values 1–3), normal (values 4+5) and flat (values 6–8). The length is just as important: The longer the fibres, the less crimped the wool, see diagram to the right. To meet our demands, fibres should have a medium value in length and crimp.

Distribution of fibre strength



Distribution of fibre strength varies depending on the wool of different sheep breeds
■ our wool ■ common wool

Length and crimp



Both factors depend on each other and vary depending on the origin of the sheep's wool





lavalan[®] products

lavalan[®] sport, plus, dark brown

lavalan sport is Baur's most known insulation product, which the sports and fashion industry already appreciates for many years. The 'sport' quality delivers best functionality due to the very high portion of virgin wool, still providing strong durability and 'easy-to-care' features.

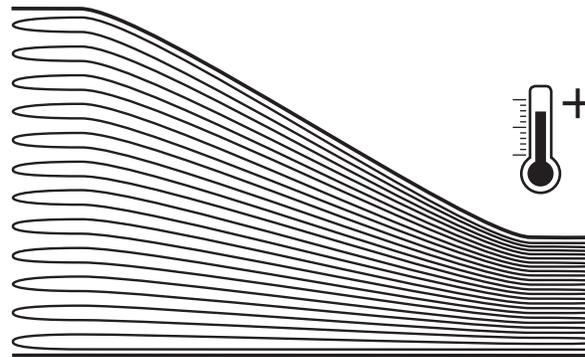
lavalan **sport (art. 549 341)** comes with the highest portion of wool fibers within the lavalan product family (average 85%) which results in our best performing wadding. The higher the part of virgin wool the better our nonwovens are in the areas of insulation, temperature regulation, moisture management and odour resistance.

Like all lavalan products, the wool fibers in lavalan sport are thermally bonded with PLA fibers. After carding and combing, the layers are heated up so that the PLA fibers melt throughout the fleece and connect the wool fibers on countless spots. This makes lavalan sport – next to its unbeaten functionality features - a strong, long lasting and 'easy-care' filling for all kinds of fashion and outdoor garments, like active & mountaineering apparel, ski & bike wear, sleeping bags, etc.

lavalan sport can be ordered in a wide range of weight categories. It is available from **40g/m²** for light padded summer garments up to **250g/m²** for very puffy winter jackets and parkas.

lavalan sport is also available in a natural **dark brown** colour version (**art. 569 341**). It is mainly used in order to avoid undesired see-through effects. No need to mention that brands aiming for a pop of luxury appeal also tend to use the dark brown colour version. The portion of virgin wool and PLA remains unchanged in comparison with lavalan sport.

lavalan **plus (art. 549 343)** has been developed with a slightly lower portion of virgin wool versus lavalan sport (average 75%). This ends up in a more durable and abrasion resistant padding, reaching almost the same loft and functionality. lavalan plus is particularly used in winter and skiing gloves.



Thermal bonding

After carding and combing the lavalan layers are heated up in order to strengthen the nonwoven

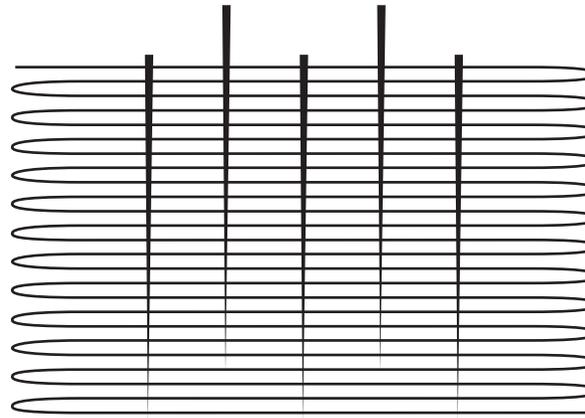
Available standard weights

Article No.	Article	Weight g /m ²	Portion vw in %
549 341 03 040	lavalan sport	40	70
549 341 03 060	lavalan sport	60	80
549 341 03 090	lavalan sport	90	80
549 341 03 120	lavalan sport	120	82
549 341 03 150	lavalan sport	150	82
549 341 03 180	lavalan sport	180	82
549 341 03 200	lavalan sport	200	85
549 341 03 250	lavalan sport	250	85
549 343 03 060	lavalan plus	60	70
549 343 03 090	lavalan plus	90	70
549 343 03 120	lavalan plus	120	75
549 343 03 150	lavalan plus	150	75
549 343 03 180	lavalan plus	180	75
549 343 03 200	lavalan plus	200	75
549 343 03 250	lavalan plus	250	80
569 341 03 040	lavalan dark brown	40	70
569 341 03 060	lavalan dark brown	60	80
569 341 03 090	lavalan dark brown	90	80
569 341 03 120	lavalan dark brown	120	82
569 341 03 150	lavalan dark brown	150	82
569 341 03 180	lavalan dark brown	180	82
569 341 03 200	lavalan dark brown	200	85
569 341 03 250	lavalan dark brown	250	85

lavalan® pro

lavalan pro is stronger and more durable than lavalan sport due to its higher portion of PLA and due to its manufacturing process.

lavalan **pro (art. 549 354)** almost has the same functional benefits as lavalan sport, but carries a 10 % higher portion of PLA on average. Another important feature is a second manufacturing process. In addition to the thermal bonding the nonwoven is needled flat which results in a denser and more abrasion resistant wadding. Thus, lavalan pro offers additional protection and cushioning which makes it a perfect insulation for gloves, workwear and protective gear.



Thermal bonding and needling

In addition to being thermally strengthened, the nonwoven gets needled flat

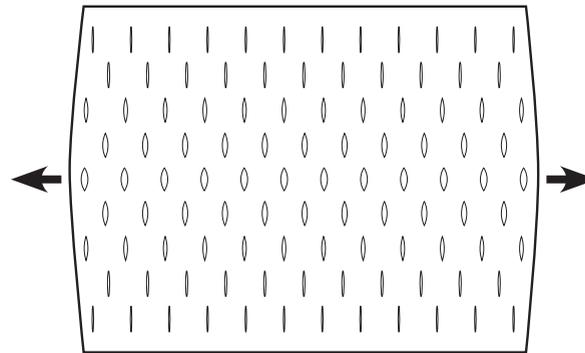
Available standard weights

Article No.	Article	Weight g /m ²	Portion vw in %
549 354 03 060	lavalan pro	60	70
549 354 03 090	lavalan pro	90	70
549 354 03 120	lavalan pro	120	75
549 354 03 150	lavalan pro	150	75
549 354 03 180	lavalan pro	180	75
549 354 03 200	lavalan pro	200	75
549 354 03 250	lavalan pro	250	80

lavalan® stretch

A well thought slotting process makes lavalan stretch the woolen filling alternative for all products that require additional freedom of movement.

After the thermal bonding, lavalan **stretch (Art. 549 342)** passes through a sophisticated slotting process which adds further elasticity to the nonwoven without using elastane, spandex or similar man-made fibres. A little higher portion of PLA makes lavalan stretch still a robust and durable wadding that generates a high degree of wearing comfort and that perfectly works in all areas with need for extra freedom of movement, i.e. in skiwear, or in elbow/knee/shoulder areas.



lavalan stretch

The sophisticated slotting adds further elasticity to the insulation fleece

Available standard weights

Article No.	Article	Weight g /m ²	Portion vw in %
549 342 03 060	lavalan stretch	60	70
549 342 03 090	lavalan stretch	90	70
549 342 03 120	lavalan stretch	120	75
549 342 03 150	lavalan stretch	150	75
549 342 03 180	lavalan stretch	180	75
549 342 03 200	lavalan stretch	200	75
549 342 03 250	lavalan stretch	250	80

lavalan® wooltube

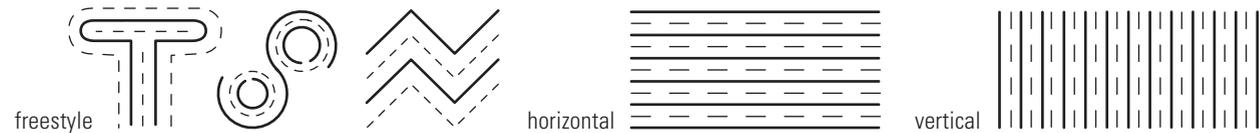
lavalan wooltube is a carded sliver made from standard lavalan ingredients, virgin wool and PLA. It creates a puffy, 'down-like' look and feel, offering unlimited quilting options and providing all the benefits of wool.

Down fillings are unbeaten when it comes to puffiness, packability and insulation in very cold and dry environments. Nevertheless they tend to overheat the wearer in case of high activity levels and their insulation power lacks in wet and humid conditions. Here is where lavalan **wooltube (art. 549 634)** comes into its own. The thermal bonded sliver is available in two

different weights, 6g and 9g per linear meter, and can be quilted in unlimited design patterns and directions. Not necessary to mention that our wooltube provides all the benefits of wool, temperature regulation, breathability and odour resistance.

Available standard weights

Article No.	Article	Weight g /lm	Portion vw in %
549 634 03 006	lavalan wooltube	6	80
549 634 03 009	lavalan wooltube	9	80



Unlimited quilting options

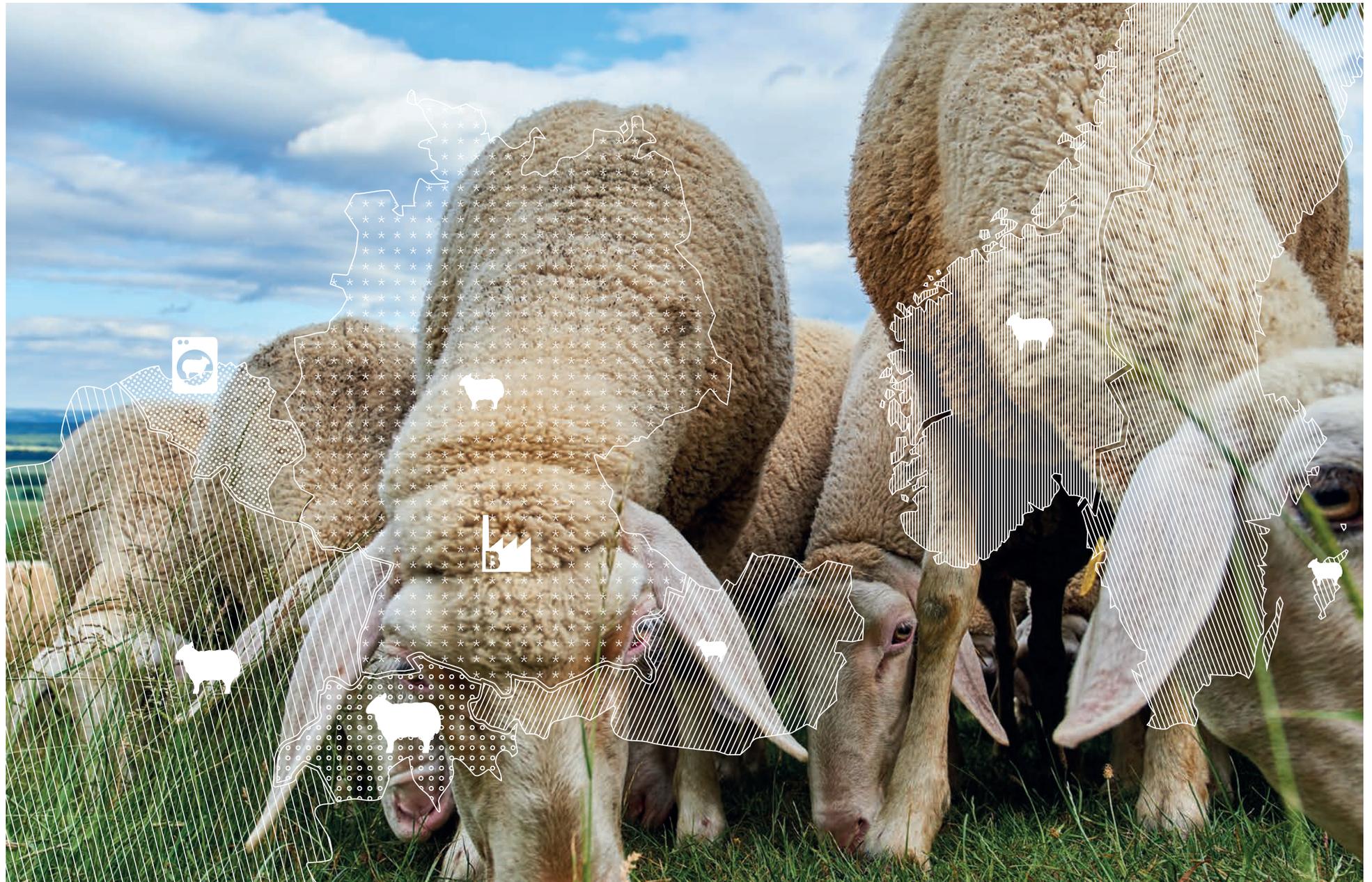
The thermal bonding enables completely new design possibilities for padded products

lavalan® weight recommendations

Different fields of application require different weights of our lavalan insulations. Below table indicates, which weight is the perfect match for a

certain activity or purpose, not considering air permeability or insulation power of the lining and shell fabrics.

Weight g/m ²								lavalan weight recommendations
40	60	90	120	150	180	200	250	
x	x							light padded summer products – running, biking or indoor sports / high level of physical exertion in cold temperatures – alpine touring, cross country skiing / moderate level of activity in warmer conditions
		x	x	x				moderate activities in colder temperatures – winter walks / alternating phases of high exertion and recovery – alpine skiing fashion pieces during the transition period – simple walks, shopping trips
					x	x		low physical outdoor activity during the cold season / urban winter fashion
							x	for almost being motionless at very cold temperatures – hunting



Our wool: naturally modern

More and more customers feel uncomfortable in clothes from the globalized textile industry. They want to know, under which conditions my jacket was produced? Where do the raw materials come from? Were they grown in an environmentally friendly way?

This is our approach: Our wool comes exclusively from sheep all over Europe. They graze in the idyllic surroundings of the Austrian and Swiss Alps. They are kept in natural conditions on pastures in Germany and France. Their fur protects them from the harsh climate of the Scandinavian Fjells. Switzerland and Norway are among the nations with the world's most rigorous standards of animal welfare. It is crucial for us that no sheep are tortured, neither during breeding nor during the shearing process.

We can prove the origin of our most important raw material from sheep to the finished product – true to the motto 'from sheep to shop'. That allows critical customers to track the way back to the wool collection point.

The independent Swiss company UniqueTrace certifies the origin of our wool, which ensures a transparency in the production process which we are most proud of. We guarantee short travel times: Our European wool

doesn't need to be shipped halfway round the globe in containers. Farmers from the Alps supply the raw material directly to our collection points. Before processing, the wool gets scoured at traditional plants in Belgium and the United Kingdom, where they still know all about the best practices for the gentle cleaning of this precious raw material. Back at Baur Vliesstoffe in Germany about 60 experienced employees with a knack for wool take care of the subsequent lavalan production.

Even at the end of its lifecycle, the filling doesn't turn into plastic waste. This is because our wool and corn are biodegradable. Everything we manufacture is recyclable. We make sure that remains of the manufacture are returned into the production cycle and processed into new products.

Textiles made of lavalan additionally help to save resources. Wool cleans itself, thus simple ventilation is often enough, saving unnecessary washing processes.

And that's the bottom line: People who buy a lavalan jacket can wear it with good conscience.



lavalan is natural

Only wool and corn is used – our nonwoven in a row is renewable and biodegradable



lavalan is washable

Our wool nonwovens are easy-care, they can be machine washed



lavalan is animal friendly

We respect animals and care about high animal welfare standards



lavalan is high tech made by nature

Wool is one of the world's most technically advanced fibres



lavalan with zero-waste philosophy

Just like worn clothing, production residues are returned into the production cycle



lavalan is traceable

Our wool is traceable from 'sheep to shop'

A scenic landscape featuring rolling green hills under a hazy sky. In the foreground, a herd of sheep is grazing on a grassy slope. A dirt road winds through the middle ground, and several tall, thin evergreen trees are scattered across the scene.

Baur Vliesstoffe

Schulfeldstraße 4
D-91550 Dinkelsbühl-Sinbronn

Phone +49 (0)9851 555 1532

E-Mail info@lavalan.com

www.lavalan.com

 /lavalanwool