



## Green/sustainable clothing made from 100% Llama Fiber by Altiplano Insulation, Inc.

Though there are no naturally-occurring green llamas, “green” is the color that best describes their fiber.

Llama fiber clothing from Altiplano Insulation is made from an all-natural product and possesses numerous **green** (low environmental impact) qualities that impart a high degree of **sustainability**. The multiple dimensions of llama fiber give rise to its many green/sustainable advantages. **Performance, Comfort & Appearance, Maintenance & Longevity, and Production** are the issues of primary consideration when evaluating the green/sustainable qualities of clothing and they guide this discussion.

### PERFORMANCE

*Insulation/Moisture Regulation:* These qualities are typically discussed separately in the evaluation of a clothing fiber’s performance. Given their interdependence, they are more effectively discussed together. Llama fiber is **hollow** and provides **superior insulation** on a warmth/weight comparison with other fibers, especially synthetics. A jacket of llama fabric will provide a comfort range of 50+ degrees while a comparable layer of synthetic will provide a 15-20 degree range. Llama fiber’s remarkable ability to **self-regulate body moisture (often referred to as breathing and wicking)** allows this wide insulation range without overheating or perspiring. The hydrophobic qualities of petroleum-derived synthetics that trap perspiration next to the skin along with synthetics’ low insulating capacity produce a much narrower comfort range in which the wearer is both warm and perspiration free.

*Water repellent and wind resistant:* Llama garments can be comfortably worn in snowy, damp, or blustery conditions. The fabric is not waterproof, but **sheds moisture** well, is **warm when wet**, and **dries quickly**. Because of its ability to regulate body moisture, it keeps the wearer drier than many waterproof fabrics that cause internal saturation from perspiration. Wind protection is higher with llama fiber than synthetic fleece and can be increased significantly with weave structure and type of under layer.

*Flame retardant and self-extinguishing:* Animal fibers are naturally non-combustible and llama fiber is no exception. It will singe, but will not ignite or support a flame.

### Green/Sustainable Advantage of Llama Fiber

- **Reduce clothing layers** necessary to achieve insulation and moisture regulation. This dictates reduced resource consumption in the production, distribution, maintenance, and disposal of additional layering garments.
- **Reduce heating requirements** of work and living areas. The garments can be comfortably worn inside or outside with seamless transition.
- **Versatility of garments** reduces the number of pieces necessary for different seasons and climates.
- **Travel lighter** with fewer garments.
- **Insulating capacity** is unaffected by compression, wear, or age
- **Safer** to wear near open flame and will not melt from sparks or embers. Garment will not be irreparably harmed by incidental contact with flame or ember.

### COMFORT AND APPEARANCE

Comfort and appearance are paramount to producing green clothing. It doesn’t matter how environmentally friendly or high performance a garment is. If it’s not comfortable and good looking, it will not be worn and all the resources invested in producing that piece of clothing are wasted. Our llama outerwear is noted for its comfort and good looks. Llama fiber has a **fine diameter** and **low scale** which give it a naturally **soft hand** and a luxurious feel. The llama produces fiber in an array of **rich colors** that impart a natural luster unmatched in synthetic textiles. Our **designs are traditional**, functional, and time-tested for comfort. We use **natural, neutral colors** (we do use an overdye on our true black fabric) from the llama’s fleece to produce basic colors that are enduring and coordinate well with colorful accessories.

### Green/Sustainable Advantage of Llama Fiber

- **Natural softness and low scratch** eliminates the need for super washing fiber with chemical agents to reduce scales and resins that coat scales. Super washed Merino wool requires this to eliminate the itch of its prominent

scale. Llama fiber is **naturally hypoallergenic**. It is a dry fiber and contains no lanolin so it doesn't have to be subjected to the heavy scouring that sheep's wool requires. This eliminates the scouring agents that often contribute to wool allergies.

- **Thermostatic regulation** of body temperature eliminates the weight and encumbrance of extra layering garments and the clamminess associated with synthetics.
- Convenience of **not adding, shedding, or carrying layering garments** as environmental temperatures fluctuate.
- **Reduces the use of dyes** and associated color fade.
- A comfortable garment is worn preferentially and fosters a personal attachment resulting in protracted use until the piece is fully worn out. The comfort of these garments coupled with their longevity, **reduces the number of garments purchased** over time solely for change or variety.

## MAINTENANCE & LONGEVITY

The maintenance requirements of llama fiber garments are quite low. The fabric has **low static electricity** because of its ability to maintain a basal moisture level. Thus it doesn't attract debris, hair, lint, etc., is naturally clean, and doesn't require frequent washing. It is **naturally stain resistant and naturally antimicrobial** so it doesn't hold odors. The fabric is very durable and resilient, **will not mat or pill**, and is **washable** (lay flat to dry).

### Green/Sustainable Advantage of Llama Fiber

- **Eliminates dry cleaning** and the harmful chemicals that process employs.
- **Laundering is minimal** and doesn't require machine drying. This significantly reduces water and energy consumption common to these processes.
- The garment's function is a result of the natural properties of the fiber and is **not dependent on chemical treatments or coatings**. These coatings and treatments can wear off and compromise the garment's function or weaken the fiber and shorten the garment's life. Llama fiber garments are **long-lived** and eliminate the waste of resources common to clothing that loses functionality or wears poorly because of chemical treatment or the loss of a coating.
- Enduring good looks. Because the **fabric will not mat or pill**, the outward appearance remains unchanged with wear, time, and cleaning. So there is no premature retirement of a serviceable garment solely because of surface appearance.
- Traditional designs and **natural colors** that are neutral and don't fade will span fashion trends and outdating. This allows use of the garment until it is fully worn out while always dressing tastefully.

## PRODUCTION

Llama fiber is an **all-natural, renewable** product. It is **shorn annually** from the llama, a native of the high altitude altiplano region of the Andes Mountains of South America. The llama is a domestic camelid species raised for centuries by the native Quechua people for food, fiber, and transportation. At present the **fiber is underutilized** and contributes primarily to a **subsistent native economy**. Llamas and alpacas are the only domestic species well-adapted to, and compatible with, the **harsh yet fragile altiplano** environment.

### Green/Sustainable Advantage of Llama Fiber

- Llama fiber is sustainable because it is produced as a **by-product of a natural environment** and is harvested **without damage** to any part of that environment, most importantly the llama that produces the fiber.
- A natural product, llama fiber is **biodegradable**, eliminating the ultimate disposal problem of synthetic fabrics whether they're from recycled sources or not.
- Because llama fiber does not require chemicals in processing or production, the industrial impact on the environment is minimal and assures sustainability.
- Llama fiber is **organically produced**. The animals are indigenous to the altiplano and browse native plants with great efficiency. Because they are a natural part of the ecology of the region, llamas have a **healing effect** on the land which is sorely in need of restoration after centuries of colonial exploitation.
- The Quechua culture (the Incas are probably the most notable ethnicity) was highly developed prior to the Spanish conquest of the Andean region. The llama played a prominent role in the region's pre-conquest culture and economy. **Colonization** displaced these people, their culture, and their economy and they remain **marginalized** today. Reestablishment of fiber production and the associated textile/clothing production from the llama offers these people the opportunity to **return to their native culture in a manner that is compatible with their environment and allows their participation in a viable, sustainable economy**.

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