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Technical Wool

TECHNICAL INFORMATION [OMNITHERM® /OMNILITE®]

In today's marketplace, there is no shortage of techno-jargon, promises and claims about the "ultimate". But after fifteen years of study, refinement, and unsurpassed field performance, we deliver Omnitherm® wool with an assurance that does not require a degree in textile engineering to decipher.

TECHNICAL WOOL

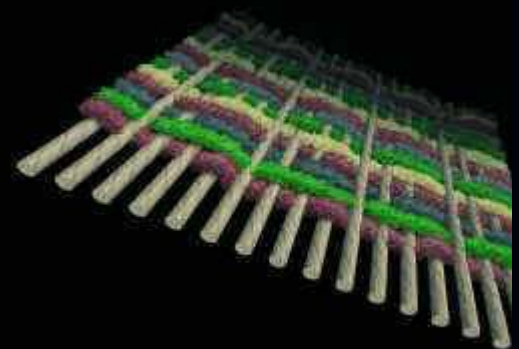
Omnitherm® is woven in a special 5-ply configuration that shed water much like the fur on a wolf or shingles on a roof.

Omnitherm® is a shrink-stabilized, weather-tight multi-ply woven wool fabric -- a long way of saying our process makes the wool more water and wind repellent, more durable, higher in loft, better at insulating and far more breathable. Stabilizing a wool fabric for repeated trips through a washing machine is a difficult job. It requires additional time and expense, along with close attention to materials.

We spin our own 100% virgin wool yarn with an exclusive process using only fine grade top cut (not scratchy) wool with a high percentage of long fiber.

The 100% virgin wool is spun in an exclusive process that interlocks the short and long fibers into an exceptionally strong, durable, and stable woolen yarn.

Each color of Omnitherm® is a yarn dyed separately with our own organic dyes which are absolutely UV neutral. That means they will reflect light exactly like the rest of the natural world so that you won't stand out in any wavelength of light. And of course our dyes are colorfast so the pattern won't fade away.



The fabric that comes off these looms is tight enough to earn a dry clean or hand wash label, but it's not ready for the Omnitherm® label. We finish the fabric with an exclusive process that includes repeated shrinking. The end result is a fabric that is unmatched in field performance and ease of care.

Omnitherm's® Camouflage pattern isn't printed onto the fabric -- it's woven in, on specialized fine index looms. They isolate one color yarn on top and hide the four additional strands underneath. We use the best looms of their kind in the world.

MACHINE WASHABLE

Omnitherm® is Machine Washable, but getting dirt out is only part of the story. Most people think "hassle" when they think about cleaning wool clothing. That's why we thought it worth the additional expense and time to manufacture a wool fabric tough enough for repeated trips through a washing machine. The standard Hand Wash or Dry Clean Label would have gotten us off the hook. We could have made it cheaper and left the shrinkage problem for you to solve.

But we thought our customers would appreciate the ability to take their mud-caked, blood-soaked clothes to their laundry room instead of the dry cleaner.

And we knew they'd just as likely dry their gear in a hot cook tent, and need to fit into it the next day.

So we chose a fine grade of wool, a more expensive process to spin our own, organic dyes, special looms, and an extended finishing process - all cost more time and money, but ensure a superior product.

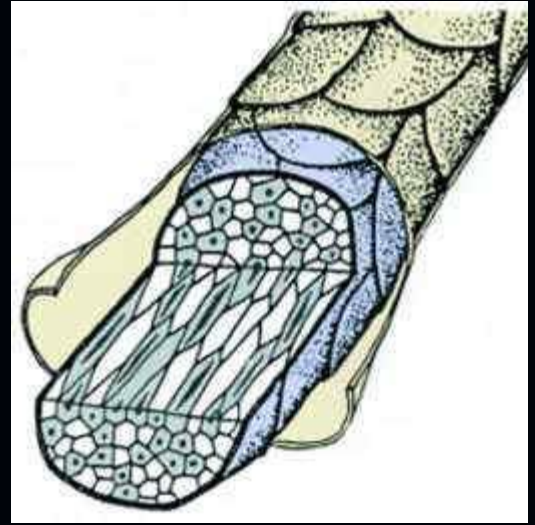
And then we made an important discovery. After Omnitherm® took a few trips through a washing machine, the already tight weave got even tighter.

It blocked more wind and shed more water while it remained just as breathable. Each washing left the fabric revitalized, feeling softer and thicker.

When you own Omnitherm®, getting dirty when you hunt is not a problem, it's an advantage. No hand washing big wads of wool or signing big checks at the dry cleaners. Just throw your gear in the washing machine, use cold water and the gentle cycle. After the final spin, give it a firm stretch while the fabric is still wet and then hang it up to dry.

THERMAL AND VAPOR DYNAMICS

Mother nature did a remarkable job designing a wool fiber. Rather than ignore moisture like a synthetic fiber, wool uses moisture to keep you comfortable. Each wool fiber consists of an absorbent (hydrophilic) core surrounded by a nonabsorbent (hydrophobic) shell. The moisture that comes off your skin is full of latent heat, and if you ventilate all the moisture away, the heat goes with it; hence the constant layering shuffle with synthetic fabrics. But with wool, the heat stays with you because the shell of the fiber separates the moisture and the air to avoid evaporation chill. That's why wool keeps you warm even if you get wet. Wool works in open air like a wet suit works under water with one added feature: wool also uses stored moisture to cool you down when you heat up. The result is an amazing flywheel effect that adjusts naturally to keep you comfortable over a wide range of conditions.



Latent Heat



Body Moisture transformed into vapor contains significant latent heat which wool can absorb. The vapor moves through the hydrophobic sheath of each wool fiber into the fiber's core. This keeps heat in the clothing envelope around the wearer without evaporation heat loss.

Insulating systems that wick away all bio-vapor also remove the latent heat it contains. To compensate, they need additional insulating loft and more on-and-off layering adjustments to match ventilation to activity level.

Sensible Heat

Unlike synthetic fibers, wool fibers have the ability to conduct and hold heat. This "sensible heat" is stored in the wearer's insulating envelope. This provides a flywheel effect -- self-adjusting to reduce the amount of

fiddling with the layers as weather and activity levels change.
Wool can also absorb radiant heat from the sun or from a fire without danger from flammability.

Dew Point Control

Low body heat output in extreme cold will often locate the dew point (point of 100% relative humidity) to the exterior region of the insulation layer and inside the exterior shell garment. Since Omnitherm® absorbs body vapor and uses its latent heat, it does not lose insulation ability when the dew point moves inside exterior shell layers with breathable membranes in extreme cold conditions. This is especially important in stationary or very low activity operations.

Insulating fabrics that ventilate all vapor are less effective when condensation of vapor occurs inside exterior shells. Moisture left in the insulation greatly increases the amount of insulating loft or bulk required to provide the equivalent insulation.

Insulating Coefficient (clo)

Insulating effectiveness in all clothing systems is provided by dry, trapped air. The removal of body moisture into the wool fiber core keeps the trapped air in Omnitherm® drier, greatly increasing the insulating coefficient of the fabric. Even when soaked, Omnitherm® maintains sufficient insulating ability to help avoid hypothermia.

LAYERING

Omnitherm® takes the hassle out of layering. Omnitherm® makes an incredible range of temperatures comfortable: the same shirt and pants that keep you warm at 20 degrees below zero will also be comfortable at 60 degrees above zero. This is possible with a minor change in the layer you put underneath. The layer you choose depends on a variety of personal factors: metabolism, physical condition, style of hunting, acclimatization, and general health. The under layer that is right for you may not be for the guy in the next bunk.

The under layer fabrics that have proven best for use with Omnitherm® gear are silk, medium weight and expedition weight synthetics, and a wool sweater.

Vapor Regulation Barrier: Silk is all you need under Omnitherm® when conditions are mild and temperatures are above freezing. No fabric feels better against your skin. Silk regulates moisture without adding insulation. That means that when you sweat, silk keeps moisture on your skin to cool you. It dries quickly when you cool off, and

Polypropylene or Polyester? Under a microscope they look the same and their performance is similar. However, polyester fibers have a much higher melting point -- they can take hot wash water and a hot dryer where polypropylene cannot. Since synthetic

stays amazingly odor-free. Put your silks over your expedition weight synthetic when conditions are cold and windy.

Synthetics: When it's cold, synthetic fabrics work the best. Synthetic fibers do not absorb moisture so these fabrics are easy to keep dry.

Omnitherm's® ability to regulate moisture keeps them even drier and greatly enhances their insulation. Thicker fabrics (expedition weight) trap more air and so add more insulation.

fibers do not absorb water, the hot water wash helps to get them cleaner and to remove odors.

Wool Sweater: In extreme cold, add a wool sweater over your expedition weight polys for more loft.

Protection Layer: Omnitherm® is extremely weather tight, so a waterproof storm shell is only required in heavy sustained rain or high winds.

Multifunctional, Simplified Layering

Omnitherm® allows a single layer of clothing to provide the same functional range of insulation and weather protection typically provided by three layers of synthetic fabrics. Three functions -- insulation, vapor-permeable waterproof membrane, and breathable protective shell -- are all provided in one layer of Omnitherm®. The single-layer versatility ends the constant rearranging of layers on and off to accommodate changes in weather. Who wants to be fiddling with clothing when you'd rather be at the ready or focused on moving into position? Omnitherm remains comfortable over an exceptional range of activity, temperature, and weather. Your complimentary layers work more effectively with Omnitherm, too.

----- Omnitherm® is 24 - 26 oz. ----- Omnilite® is 13 oz. -----
EYE-D-VERSION

It's a fair question. Why do your eyes skip right over a motionless deer in plain view? The reason is simple, and rests on the elemental process of vision perception. Countless light rays reach the eye every instant. The brain compares the light information and then decides what are the objects and what is the background.

Game animals rely mostly on contrast or sudden changes in brightness to separate the objects from the background. A sharp contrast like a silhouette against the sky is instantly recognized. Individual trees in a forest take a little more attention. The deer or mountain lion in a stand of trees is not seen because the trees offer more contrast than fur. The eye picks out the trees and ignores the fur.

Omnitherm's EYE-D-VERSION PATTERN gives the eye nothing to find, so the movement is not associated with any object.

Omnitherm also offers other exclusive camouflage advantages. We dye each strand of woolen yarn with organic colorfast dyes that are absolutely ultraviolet (UV) neutral. We began using UV neutral dyes for Omnitherm used by U.S. Military special teams -- UV neutral dyes reduce detection by guard dogs. Game animals see UV too, especially at dawn and dusk.

Because Omnitherm colors are woven in, you don't get the sharp contrast

To conceal yourself from this process you have two basic choices. You can wear a disguise that makes you appear to be a harmless thing like a tree. Or you can conceal yourself by avoiding the eye altogether. Mother nature designs fur to avoid the eye and Omnitherm's EYE-D-VERSION pattern works the same way. Slight movement is less likely to be detected.

lines of printed fabrics where one color changes to another. Yet because we use fine index looms, you still get a distinct pattern that dissolves your outline into the background.

Omnitherm EYE-D-VERSION comes in three patterns. Use Autumn or Timber in the forest or the bush where dark colors will absorb more light. In open country, above timberline, or up in a tree when all the leaves are gone, use Blowdown.