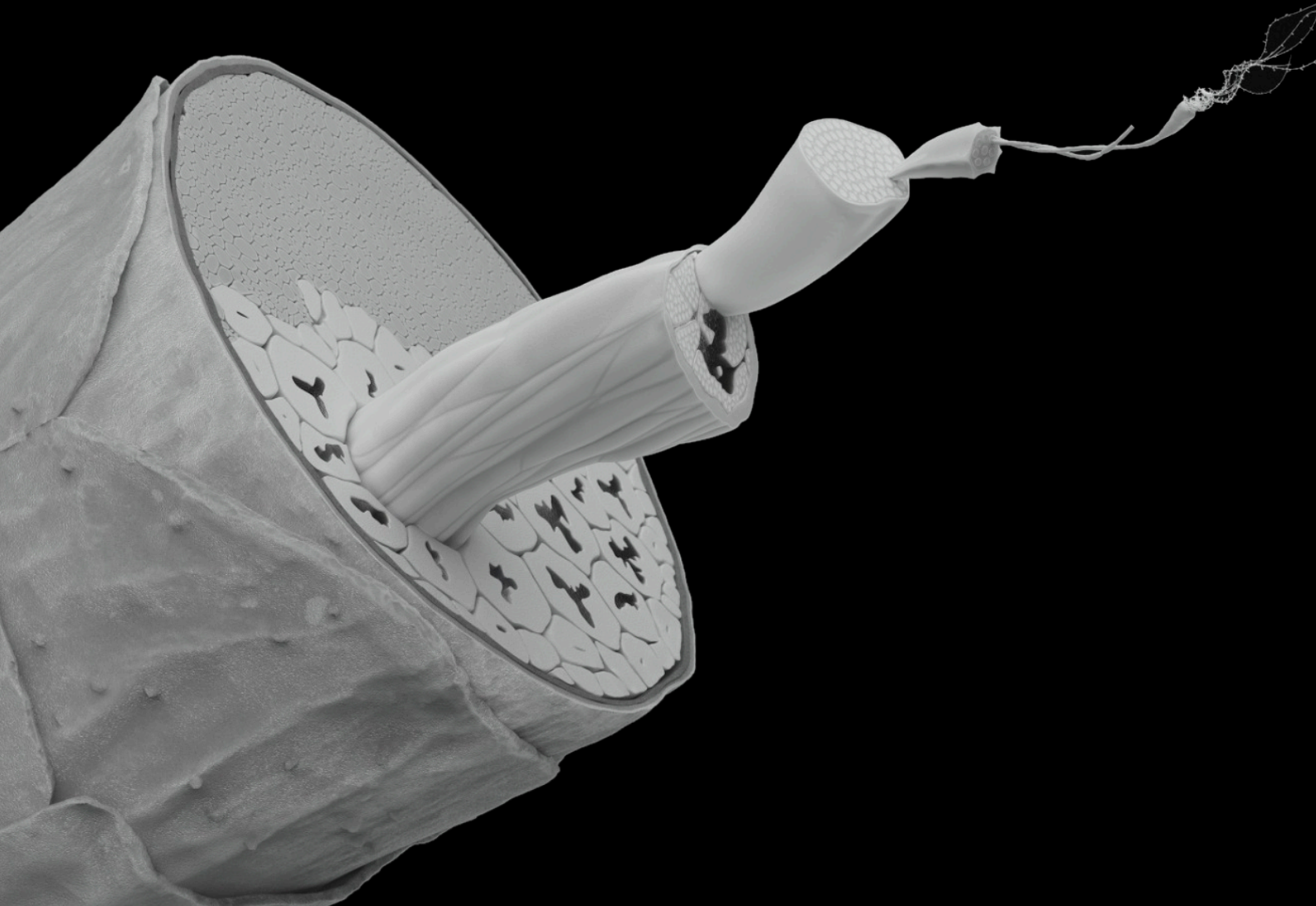




WOOLMARK

NATURAL INTELLIGENCE

60 YEARS OF SCIENCE BEHIND THE
ORIGINAL PERFORMANCE FIBRE



NOT ALL INTELLIGENCE IS ARTIFICIAL

We live in an age obsessed with making things smarter.

Clothes monitor us. Devices respond to us. Technology promises to predict what our bodies need before we know it ourselves.

Nature has been doing it for rather longer.

Wool is a fibre that responds to its environment. It absorbs and releases moisture vapour. It insulates. It buffers changes in heat and humidity. It resists odour. It can help maintain a comfortable microclimate next to the body.

These aren't added technologies. They are properties of the fibre itself and whilst natural properties are one thing, proving performance – and setting the standard for quality – is something entirely different. That has been Woolmark's role since 1964.

For more than 60 years, Woolmark has worked with scientists, universities and industry to understand, test and prove what wool can do.

This is Natural Intelligence.



NATURE BUILT THE TECHNOLOGY

At first glance,
a wool fibre is
remarkably simple.

Look closer and it is a
sophisticated natural
structure.

CRIMP

Wool's natural waviness creates pockets of still air,
providing insulation.

MOISTURE RESPONSIVENESS

Wool can absorb moisture vapour within the fibre and
release it again as conditions change.

BUILT TO RESPOND

Rather than simply forming a barrier between the body
and the environment, wool interacts with heat and
moisture around it.

The result is a fibre able to respond as people
move between environments, levels of exertion and
changing conditions.

Nature developed the fibre. Science helps us
understand how it works. Woolmark tests and
proves it.

WOOL KNOWS WHEN CONDITIONS CHANGE

DYNAMIC BREATHABILITY

Comfort for movement — and the moments in between.

Performance doesn't happen at one constant intensity.

We climb, pause, accelerate, recover and move again.

Those transitions matter.

When activity stops, heat production falls rapidly while moisture can remain trapped within clothing. The result can be the familiar cold, clammy feeling known as after-chill.

Research supported by Woolmark has examined how different fibres respond during these changing conditions.

Rather than focusing only on how quickly moisture can be moved away, the research looked at the ability of clothing to buffer fluctuations in heat and moisture as the wearer moves between exercise and recovery.

WHY IT MATTERS

The future of performance clothing isn't simply about moving moisture faster. It is about managing change better. Performance isn't static. Neither is wool.

THE NUMBER

96%

greater moisture buffering than polyester

A four-year research program found Merino wool delivered 96% greater moisture buffering than polyester, 45% greater than cotton and 25% greater than viscose in the proposed test method. Wool also delivered more stable comfort during the resting phases of stop-start activity.

Four peer-reviewed studies investigated this Dynamic Breathability performance during stop-start activities including hiking, cycling and climbing.

Move → Pause →
Recover → Move
again

Wool responds throughout the cycle.

WOOL KNOWS WHAT TO DO WITH MOISTURE

MOISTURE MANAGEMENT It doesn't just move moisture. It manages it.

Sweat is only one part of human comfort.

Before moisture appears as liquid sweat, the body is continuously releasing water vapour. Wool fibres can absorb that vapour into their internal structure and later release it as environmental conditions change.

That ability can help reduce the wet, clingy sensation associated with moisture sitting next to the skin.

THE NUMBER

25%

more moisture moved away from the skin than polyester

Research cited by Woolmark found wool fabrics could move 25% more moisture away from the skin than polyester fabrics under the tested hot, dry conditions. The measured effect was equivalent to an ambient temperature difference of up to 4°C.

Wool can also absorb substantial moisture before feeling wet.

FROM FIBRE TO FABRIC

The fibre is only the beginning.

Textile structure can amplify the way moisture moves through a garment. Woolmark research into engineered wool structures is helping explore how fibre properties and fabric construction can work together to control moisture movement more effectively.



WOOL KNOWS WHEN THE TEMPERATURE CHANGES

NATURAL THERMOREGULATION Natural climate control.

Comfort is not simply about being warm or cool.

It is about maintaining a more stable microclimate between the body and what we wear.

Wool's natural crimp traps still air, helping provide insulation. At the same time, its ability to interact with moisture contributes to the way heat is managed as conditions change.

The science helps explain something wearers have understood intuitively for generations: wool feels comfortable across change.

From the cold outside to the heat inside.
From exertion to rest.
From one season to the next.

No battery required.

THE NUMBER

3x

less post-exercise chilling

In very cold conditions studied, wearers could experience three times more chilling in synthetic garments than in wool.

WOOL KNOWS HOW TO STAY FRESH

NATURAL ODOUR RESISTANCE Freshness, built in.

Odour doesn't simply sit on the surface of clothing.

Wool's fibre structure can absorb moisture and bind odour molecules, releasing them later during washing. Keeping the skin surface drier can also make conditions less favourable for odour development.

WHY IT MATTERS

Stay fresher. Wear again. Wash when it needs it, rather than simply because it has been worn once.

That is a performance benefit people can feel — and one that can support less frequent washing, saving time and energy.

THE NUMBER

66%

less retained body-odour intensity than polyester

A peer-reviewed study found wool fabrics retained 66% less body-odour intensity than polyester and 28% less than cotton.

WOOL KNOWS HOW TO HELP US REST

SLEEP Comfort doesn't stop when we do.

Temperature and humidity fluctuate throughout the night.

Wool sleepwear and bedding can help buffer these changes within the sleeping environment, helping maintain thermal comfort.

The findings are specific to the populations and products tested.

But they reveal something increasingly relevant: what we wear and sleep in can influence the microclimate around our bodies.

THE NUMBER

12
minutes

average time to fall asleep in
wool sleepwear

In one study, adults aged 65+ fell asleep in an average of 12 minutes wearing wool sleepwear, compared with 22 minutes in polyester and 27 minutes in cotton.

A separate bedding study reported 25% more REM sleep with wool duvets, with or without wool underlays.

WOOL KNOWS HOW TO FEEL GOOD AGAINST OUR SKIN

Soft enough for sensitive skin.

The old assumption that wool inherently causes itch or allergy does not reflect the evidence for modern superfine Merino wool.

A review of 100 years of literature found no credible evidence that wool itself is an allergen; irritation is associated with coarse fibre diameter of any fibre type.

Clinical trials have also examined superfine Merino wool worn next to the skin by people with mild-to-moderate atopic dermatitis.

Natural performance can also be gentle performance.

THE NUMBER

≤17.5 μm

The reported eczema findings apply to superfine Merino wool garments with a mean fibre diameter of 17.5 microns or finer. Three dermatology trials reported reduced symptoms in infants, adolescents and adults.

WOOL KNOWS HOW TO ENDURE

DESIGNED FOR MORE THAN ONE LIFE

Natural Intelligence is not only about what happens while a garment is being worn. It is also about what happens over time.

Wool garments are among the longest-kept in wardrobes and often live on through resale, donation, reuse and recycling. Wool is the world's most recycled apparel fibre.

THE NUMBER

3x

more likely to be donated

Research cited by Woolmark found wool garments were three times more likely to be donated than garments made from other major fibres.



END OF LIFE

Wool is a natural protein fibre.

Under suitable conditions, wool fibres can biodegrade in soil and marine environments. In one soil-burial study, 100% Merino wool fabrics biodegraded by up to 95% after 15 weeks, although rates vary according to environmental conditions and product characteristics.

Performance during use.

Options for reuse.

And a different end-of-life pathway from persistent synthetic fibres.

THE NUMBERS BEHIND NATURAL INTELLIGENCE

96%

Greater moisture buffering than polyester in Woolmark's Dynamic Breathability research.

25%

More moisture moved away from skin than polyester under tested hot, dry conditions.

66%

Less retained body-odour intensity than polyester in a peer-reviewed study.

12 min

Average time for adults aged 65+ to fall asleep in wool sleepwear in one study.

3×

Wool garments were more likely to be donated than garments made from other major fibres in cited research.

95%

Biodegradation of 100% Merino wool fabric after 15 weeks under one soil-burial test.

Different studies. Different conditions. One fibre with an extraordinary range of natural performance attributes.

60 YEARS OF ASKING WHY

Wool has existed for thousands of years.

Science asks what wool can do.

Certification asks whether a product meets
the standard.

Since day one, research, testing and product
standards have been central to Woolmark's role.

That work matters because extraordinary claims
are easy to make. Evidence is harder.

Woolmark works with researchers, laboratories,
manufacturers and brands to understand wool's
properties, develop new applications and
translate scientific evidence into products people
can use.

Not because wool needs
reinventing. Because the better
we understand its natural
properties, the more
intelligently we can use them.



NATURE CREATED IT. SCIENCE EXPLAINS IT. WOOLMARK CERTIFIES QUALITY

Citizens increasingly encounter products surrounded by claims about performance, quality and environmental impact.

Woolmark's role is to provide something more useful:

Proof.

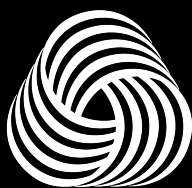
R E S E A R C H

T E S T I N G

S T A N D A R D S

C E R T I F I C A T I O N

And more than six decades of commitment to understanding one of the world's most remarkable natural fibres. Nature gives wool its properties. Science gives us the evidence. Woolmark gives people confidence in quality.



WOOLMARK

The Woolmark symbol verifies more than fibre content. It represents a standard of quality backed by evidence.

In an increasingly artificial world, that matters.

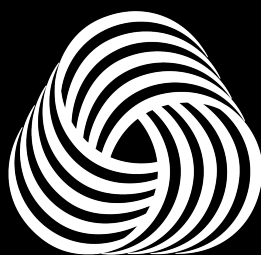
WOOLMARK

Natural Intelligence.
Return to Real.

ABOUT THE EVIDENCE

The research featured in this report draws on Woolmark-approved scientific studies and evidence summaries. Results relate to the specific fibre compositions, garment types, wearer groups and test conditions identified in the underlying research and should not be interpreted as universal performance claims for every wool product.

Full research references and approved fact sheets are available from Woolmark.



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