

A Better Night's Sleep

Recent research¹ demonstrates that, under many conditions, people sleep better if their bedding products are made from wool.

Known for the natural features of comfort and quality, wool bedding products have been proven in studies to actually help you sleep better. The moisture retention and wicking properties of wool help you to stay at a comfortable temperature, dry with less sweating and overheating.

The recent 'Sleeping Comfort' study, conducted by The Woolmark Company and the University of Sydney's Faculty of Health Science², set out to establish a scientific link between the human body, bedding products and sleeper comfort.

By establishing a Thermal Comfort Assessment Rating through a series of human and laboratory trials, the results of the study established that wool bedding products:

- Breathe more naturally than synthetic products
- Increase the duration of the most beneficial phase of sleep known as the REM or Rapid Eye Movement sleep stage, where the sleeper is totally relaxed and most dreaming takes place
- Facilitates a comfortable body temperature – the body gets to a comfortable sleeping temperature more quickly and stays there for longer.

Quite simply, it all adds up to a better night's sleep.



WOOLMARK

For years, scientific researchers have attempted to solve the mysteries of sleep.

Just why we sleep, how we sleep and the benefits sleep brings have long been the subjects of scrutiny, yet researchers are only now beginning to understand the particular function that sleep fulfils.

While science has developed a range of theories to explain the mysteries of sleep, one fact has remained constant – sleep is vital for our physical and mental wellbeing.

After all, who of us wouldn't want a better night's sleep?

Sweet dreams are made of this ... the right sleeping environment

The quality of sleep is related directly to where and how it takes place.

Bedroom and body temperatures and their interaction with relative humidity is one of the most significant variables in the sleep equation. The ideal room temperature range for effective sleep appears to be between 18 and 20° Celsius, or 64 to 68° Fahrenheit.

Studies have indicated that people attempt to actually sleep for longer when the bedroom temperature is lower than 16°C (60°F). Conversely, we may not sleep long or well enough to feel rested when the room temperature is above 21°C or 70°F.

Similarly, the microclimate that the human body creates in bed and its reaction with individual bedding products, such as mattresses, sheets, pillows, blankets, quilts and comforters also has a strong correlation with both the quality and quantity of sleep.

Product Innovation = Better Business

Wool provides a bedding industry opportunity

Wool, a natural resource, is associated with quality and integrity. According to research findings, consumers the world over trust Woolmark and are prepared to pay a premium for it, whether the product be apparel or interior textile.

For the bedding product sector, wool provides an all season business opportunity.

Manufacturers are afforded the opportunity to:

- innovate new products, tailored to specific market requirements
- develop and promote a 'total wool sleep system'
- differentiate products due to the unique wool benefits story
- provide a reliable, quality assured consumer product.

And for retailers, wool represents:

- a premium quality product
- the opportunity to market a 'total wool sleep system', selling additional wool bedding product units
- the opportunity to 'value add' through customer education
- increased turnover and profits.

What is the Thermal Comfort Rating System and how can you use it?

By testing a range of wool and non-wool products in 12, 18 and 24°C environments across a range of relative humidities, researchers were able to establish a rating of sleeper comfort. Data was collected on sweat responses, body temperatures and level of comfort experienced by subjects. The formula establishes a Thermal Comfort Rating System. The methodology for establishing a Thermal Comfort Rating System is outlined in more detail in The Woolmark Company's 'Sleeping Comfort' study. This research may prove to be of benefit to bedding product manufacturers and retailers so they can deliver product options for each season based on a simple comfort rating system.

Wool, the natural choice – presenting winning products for all seasons

How the 'Sleeping Comfort' study can help you

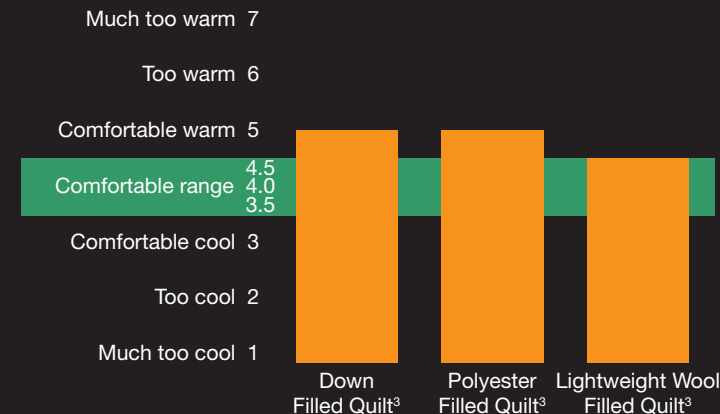
The Woolmark Company's 'Sleeping Comfort' study has established a scientific method and comfort rating system to assist:

- Assessment of bedding product development and the use of thermal imaging to consider the points of heat transfer or loss
- Analysis of filling weights or mass per square metre required for the categories of Summer, Mid Season and Winter designations in comparison to Tog Value specifications that exist in some markets and do not treat all fibres equally

- Comparison of fibre type fillings
- Development of bedding ranges to suit a wider variety of human sleep preferences, such as sleeping 'comfortably cool' or 'comfortably warm'.

The Human Subject Assessment and Water Filled Bladder tests were established specifically for the 'Sleeping Comfort' study but they are available for use by manufacturers to conduct their own R&D and marketing. The Woolmark Company can assist with tailoring, conducting and assessment of these tests and their results.

Bedding Comfort Matrix at 18°C



Although all three quilts had filling weights in the range of 180 g/m²-280 g/m², the wool filled quilt demonstrated its ability to provide sleeping comfort at 18°C

The Science of Better Sleep

Key findings from the research report available for purchase now

The Woolmark Company had a simple objective in conducting the Sleeping Comfort study – to investigate the sleep comfort properties of a range of commercially available bedding items made from wool, and to compare those results with non-wool products. The research was conducted in two stages – a pilot and a main study.

Existing sleep study data established that three ambient temperature/relative humidity conditions of 12°C (cool)/73% relative humidity, 18°C (thermoneutral)/50% relative humidity, and 24°C (warm)/35% relative humidity represented “a majority situation sleeping temperature range”¹ globally.

This range of temperature and humidity conditions replicates the three major bedding markets of the world.

Ideal sleep conditions

In the study’s human sleep trials, participants established that average skin temperatures between 34 and 35°C were assessed as being ‘comfortable’. Skin temperatures greater than 35.5°C were reported as ‘too warm’ and those less than 33°C were assessed to be ‘too cold’.

A comfort scale was then used to assess the subjects’ reporting of Thermal Comfort with the wool and non-wool products.

Once the pilot had established the scientific basis for testing sleeping comfort, a series of commercially available wool and non-wool bedding products were assessed individually and then compared to each other.

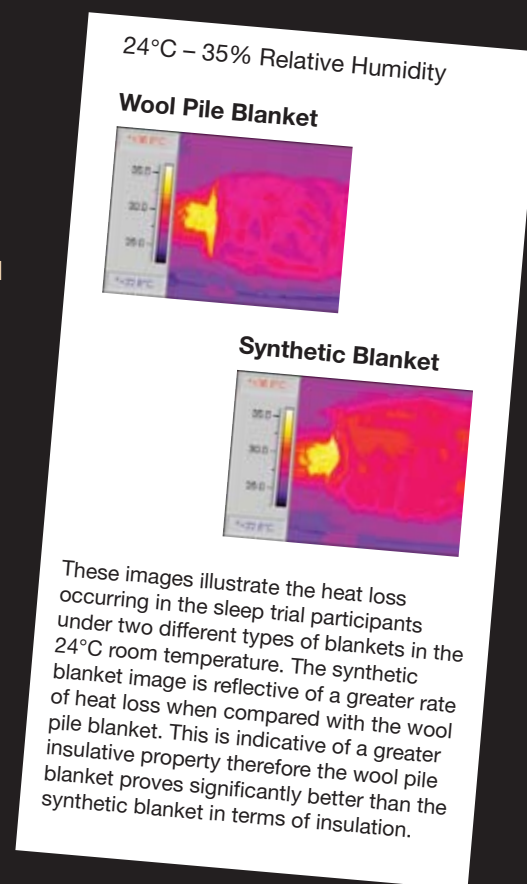
The Water Filled Bladder (WFB)

To provide a further scientific test based on the human subject research findings, the researchers developed a ‘Water Filled Bladder’ (WFB) apparatus and test method to assess each of the wool and non-wool products.

The results can then be compared to ‘control’ products to establish a comfort rating in each condition. For further information and a ranking of the wool and non-wool ‘underbody’ and ‘overbody’ bedding products tested, please see the ‘Sleeping Comfort’ complete study report.

Thermal imaging

Finally, thermal imaging technology was used to determine and track ‘hot’ spots during a typical night’s sleep. Thermal imaging showed scientifically which products and which combination of products provided optimal thermal sleep conditions.



Results

Within the cold 12°C condition, wool quilts were ranked 1st and 2nd of the wool and non-wool products tested³. In the ‘overbody’ product test, the wool pile blanket and the wool filled quilt were both described as ‘ideal’ by subjects. In comparison, the synthetic blanket was described as ‘cold’ until the 40 minute mark and did not provide uninterrupted sleep.

In the 18°C assessment, a pure wool quilt was ranked the number one performer as ‘warmest’ as well as being ‘comfortable warm’ according to the comfort scale. And while there were differences in the level of thermal comfort between the wool and non-wool ‘overbody’ products, the wool quilts ranging in fill weights from 250 g/m² to 500 g/m² rated highly.

A pure wool quilt with 500 g/m² fill weight ranked ‘warmest’, as expected, in the higher temperature (24°C) environment. The lightweight wool quilts with fill weights of 250 g/m² proved popular with the subjects, but most of the products, both wool and synthetic, were considered ‘too warm’ and uncomfortable under this condition. A few products did however, achieve a ‘not as comfortable but bearable’, ‘comfortable warm’ rating.

¹ ‘The Sleeping Comfort Study’ SC01, The Woolmark Company, 2005

² The study was funded by Australian Wool Innovation Limited

³ See research report for exact product specification