

Skin Care & Protection



by  Shear Comfort™



About Shear Comfort™

Healthcare Innovations Australia (HIA) is a provider of specialised skin protection products for the requirements of modern healthcare.



HIA has over a decade of experience in the healthcare arena, because of this experience we understand three key things about modern healthcare: it can take time, it can cost money, and it can be complicated. But this need not be the case. We aim to address this with our range of products that not only improve the quality of life and assist in day-to-day living activities of the end user. We also offer the clinician, technician, or specialist an effective, affordable, and straightforward tool to achieve positive results time and again. We do this through the Shear Comfort™ range, of which HIA is the sole producer.

The Shear Comfort XD1900™ skin care range is manufactured through our proprietary manufacturing techniques of taking natural wool and weaving it into a density of 1900 gsm, i.e. more fibres per square metre than is possible in a natural sheepskin. This is done by weaving natural wool fibres onto fabric backing, creating a product

which is more effective at redistributing pressure, lighter to carry, and easier to wash. Shear Comfort™ products can withstand multiple washes at up to 80° C, effectively killing any bacteria. The Shear Comfort XD1900™ range can even be washed over 80° C or over, with normal detergents.

All our footwear and skin care products have been designed to offer the best protection possible, with all seams and attachments positioned so as not to interfere with the pressure care qualities. All Shear Comfort™ Skin Care products are fire retardant and carry the medical Class 1 CE mark, meaning you can be assured of receiving the highest possible quality designed for specific medical benefits. Air Tec™ gives a matrix of small holes across the leather surface to aid in air and water vapour exchange, thereby increasing the products' effectiveness in wound prevention, healing, and comfort. See page 14 for Clinical Benefits summaries.



This catalogue focusses on the Shear Comfort™ skin care range. We also have a range of footwear for those at risk of damage to their feet.



To find out more contact Healthcare Innovations Australia on 1300 499 282, E: sales@hiaus.net.au, or visit www.hiaus.net.au, or scan this QR code.



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The Benefits of Wool

for tissue integrity

The studies referred to on page 14 give the research evidence that shows that high grade wool products are effective in reducing the incidence of pressure ulcers. What are the unique properties of wool that make these products so effective?

Gefen (2011) showed that skin breakdown increases with increased skin temperature, increased ambient temperature, increased relative humidity, increased skin contact pressure, and decreased permeability of materials touching the skin. Wool-based products are the ideal basis for tissue integrity solutions to meet these challenges, in that they minimise the influence of these elements identified by Gefen.

Moisture Reduction

Moisture build up next to the skin can lead to maceration of the skin at the surface, affecting the properties of the

skin. Wool is hydrophilic, meaning that it takes up or wicks away moisture from the skin. Wool can hold up to a third of its weight of water vapour before 'feeling' wet, and therefore helps to protect against maceration, and leads to greater comfort.

Temperature Regulation

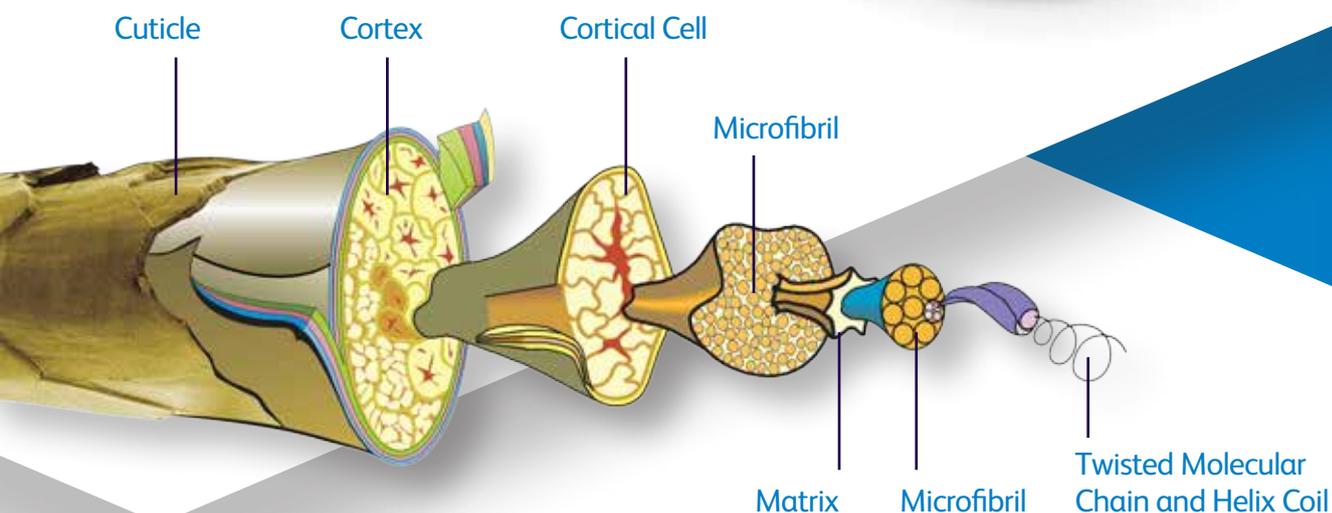
Temperature affects at the skin are important. Resting humans eliminate 25 % of their basal metabolic rate through the skin. Sitting on a cold surface results in capillary closure, which in turn results in reduced supply and exchange of nutrients to the

cells of the skin. Conversely, increased temperature results in a higher metabolic rate: a five degree increase in temperature creates a 35-40 % increase in 'metabolic stress', meaning available nutrients are used up, and waste products built up, more quickly.

Also, as body temperatures rise, sweating increases. The air zone encapsulated by the fibres in wool insulates against the cold, while allowing the air to circulate when it gets hot. Wool's ability to wick moisture assists the body's natural cooling mechanism of sweating.

Gefen, A (2011) How do microclimate factors affect the risk for superficial pressure ulcers: A mathematical modeling study *Journal Tissue Viability* 20, 81-88.

Wool Fibre Structure



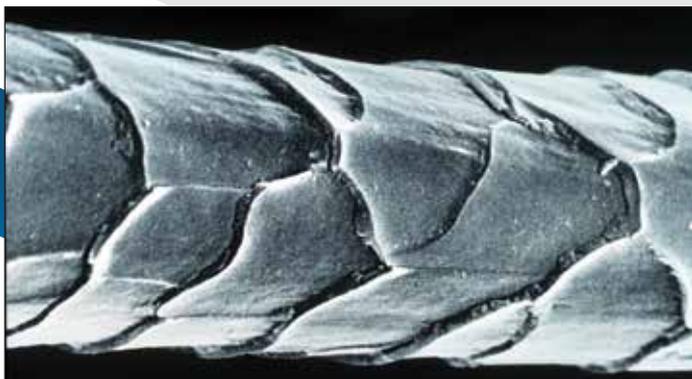


Pressure Redistribution

Medical Sheepskin and XD1900™

The high density of wool fibres found in medical sheepskin and in our XD1900™ do a great job of redistributing pressure. This is because each fibre acts as a small spring; when multiplied out this produces a very supportive surface.

Friction and Shear Reduction



Friction from movement across bed surfaces, and shear displacement of body soft tissues, can lead to long term tissue damage. The outer protein layer of the wool fibre is very smooth making the fibres slippery. This means one's skin can move across a wool surface with lessened resistance. This also allows the fibres to move past one another easily – the fibres move with the user's movements rather than pulling on the skin, thereby reducing frictional forces. The ability of the wool pile to collapse sideways under pressure reduces the shear forces – this varies according to the 'nap' of the wool in the support surface: there is less resistance in one direction than the other. This is similar to the pile of an animal's fur, which feels smooth when you stroke it in one direction, and rough when the direction is reversed.

XD1900™

Extra Density, Extra Benefits

Healthcare Innovations Australia (HIA), following years of research, has brought XD1900™ to the market. XD1900™ is an extra high density woven wool material specially developed for skin and pressure care.



Medical grade sheepskin has been proven to reduce the occurrence of pressure ulcers (see p14), but HIA wanted to go one step further and improve upon what Nature could produce. Sheepskins are natural products, but Nature is variable. Natural sheepskin wool density varies from animal to animal, and can range from 800 to 1200 grams per square metre (gsm).

Our proprietary manufacturing techniques are able to take natural wool, and weave it into a density of 1900 gsm. Thereby we boosted the already impressive capabilities of natural sheep skin, and are able to manufacture a product that is consistent from batch to batch, and across the whole surface area. We can manufacture overlays up to the width of a bed without the need to join sections together, with less wastage and therefore cost savings for our customers. An additional benefit is that because we no longer have a leather or skin backing, XD1900™ can be washed with standard detergents, for example in an institutional wash, at 80°C or over.

Natural vs Synthetic

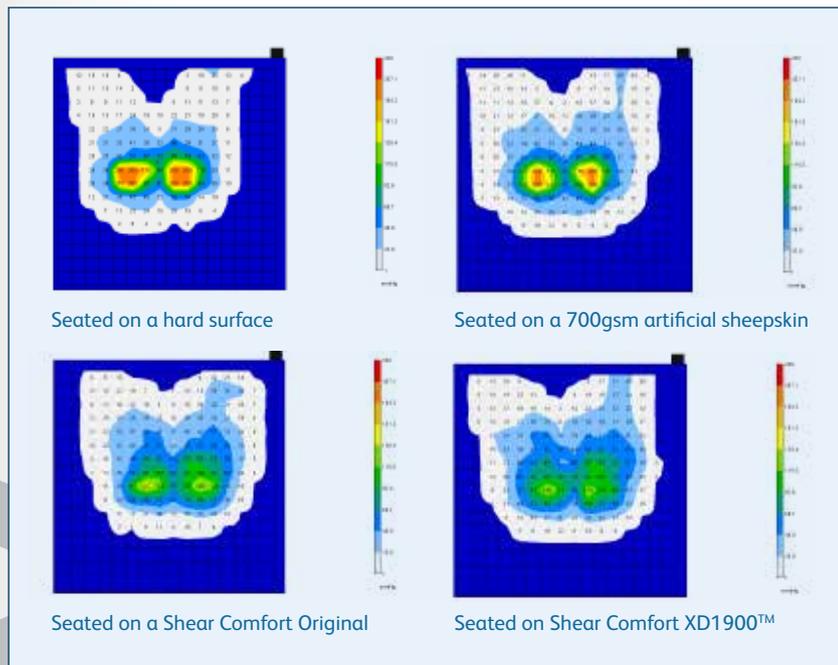


XD1900™ uses natural wool and a manufacturing process to achieve the extra density. It is the natural properties of wool that provide the protective and therapeutic benefits of our overlays.

- Polyester and other artificial fibres were brought to the market because of their ease of washing at high temperatures, but they do not provide the resilience of wool fibres, and are easily compressed, thus having minimal pressure redistribution properties.
- Synthetic fibres are also hydrophobic, so cannot provide the moisture absorbing properties of wool.

Density

Therapeutic Properties



Accepting that wool is a more beneficial material than synthetics, the density of the wool fibres in an overlay is still very important to ensure the therapeutic properties of the sheepskin. Lower densities compress too easily, removing the pressure redistribution, shear reduction, and temperature/moisture regulation properties. Over the years, low density (under 700 gsm), low cost sheepskins have tarnished the image of natural sheepskins. Indeed these low density products have very limited clinical application. Alongside you can see the comparison between the pressure distribution properties of a 'high end', but typically lower density woven wool product (700 gsm) and XD1900™ (1900 gsm)

- Synthetic fibres' compressibility squeezes out trapped air, losing the temperature regulatory properties of the natural materials.
- Wool processing techniques have improved in the meantime, meaning that many wool based products such as XD1900™ can be washed at up to and over 80°C.

In summary, 'synthetic wool' products provide little of the benefits of natural wool products.



Seating & Wheelchair Protection

Those with limited mobility, or those who spend most of their time seated, such as in an office chair, can be at risk of discomfort, or of developing pressure ulcers.

These individuals can't or don't move frequently enough to relieve pressure or to allow air exchange. Our protectors are ideal for improving the well-being of these individuals.

We also have 'protectors' for areas of the chair that can often cause abrasion or areas of higher pressure.



Cushion-It™

The **Cushion-It™** can be used for either or both the seat or back of a chair. Our **Cushion-It™** is a very successful product that can improve the comfort of any chair, whether it be an office chair, arm chair, a canvas wheelchair seat, or in combination with a pressure care cushion. The **Cushion-It™** features Velcro® fastening straps that can be fastened underneath existing seating materials if so-desired – others prefer to have their **Cushion-It™** loose so that they can transfer it easily between different chairs. The **Cushion-It™** provides an ideal seating environment, allowing air to circulate while dispersing pressure and shear forces.

Foot Plate & Calf Plate Protectors

These items fit easily over a wheelchair's foot or calf plates to bring comfort and protection to otherwise rather unforgiving parts of the wheelchair. Tears and bruising as a result of bumps and scratches caused by the foot and calf plates are not uncommon, and can easily be prevented with the simple addition of our quality wool-based protectors. The **Foot Plate Protectors** come in pairs for split foot supports, or as a **Single Foot Plate Protector** for single foot supports. The **Calf Plate Protectors** come in pairs to fit over individual calf plates.



Arm Support Protectors

A well-positioned arm support can promote good posture and reduce pressure elsewhere on the body. Without sufficient padding, this can lead to discomfort or damage to the forearm. Our **Arm Support Protectors** offer a simple solution to this – they are easily slipped over the arm support of an office chair, wheelchair, etc.





Order Codes

Cushion-It™

Order Code	Description
002152	XD1900 Cushion-It™ (46 x 55cm)

Arm Support Protector

Order Code	Description
002145	XD1900™ Arm Support Protectors (Pair)

Foot & Calf Plate Protectors

Order Code	Description
002121	XD1900™ Foot Plate Protectors (Pair)
003326	XD1900™ Single Foot Plate Protector
002138	XD1900™ Calf Plate Protectors (Pair)

Overlays

We offer a range of different overlays from cot-sized to full bed.

All of our overlays are available in our XD1900™ material making them very cost effective at reducing the risk of developing pressure ulcers: they can be washed at 80°C or over, for infection control purposes using normal detergents. We also have some overlays available in medical sheepskin produced to AS4480.1 standards: these can also be washed at up to 80°C, but need a wool wash shampoo, to protect the suede material from damage.

Overlays for neonates

There has been a number of studies that illustrate the benefits for babies sleeping on wool. The rate of weight gain in underweight new-borns was 61% higher when sleeping on a wool underlay compared with a cotton sheet (Scott & Richards (1979); Scott et al (1983)). Jaundiced new-borns sleeping on wool were more settled when sleeping, as compared with those on cotton. Only around 30% of babies on wool cried compared with 67% on cotton (Powley et al (1980)). Our smallest overlay is cot-sized (Neonatal Overlay: 30 x 50cm) and ideal for babies until they move onto the next size (Paediatric Overlay: 45 x 75cm).

Pressure Care Assistant™

The **Pressure Care Assistant™** can be positioned on the bed where comfort and protection is needed, for instance under the heels, hips, shoulders, or head. It features two large cotton flaps so that it can be securely tucked under the mattress to hold in position.



Overlays

Order Codes

Turn a standard mattress into a high end pressure care mattress

By simply adding one of our overlays you can turn a standard mattress into one that compares with far more expensive pressure care mattresses. Bear in mind that the best way to affect what you're doing at the skin is by what is happening next to it – the further away from the skin you get the deeper into the body you are acting – the structure of a mattress does more for the skeleton than for the skin, whereas the overlay looks after the skin.



Natural skin microclimate control

What your Shear Comfort™ overlay does is to provide the ideal microclimate for a good sleep, looking after temperature and perspiration regulation, with the excellent air redistribution properties of a wool product.

Silent pressure care

In a residential or medical care facility, Shear Comfort™ overlays are a lower cost pressure care solution, and remove the discomfort and noise experienced with plastic based options, such as plastic air filled overlays or alternating pressure mattresses.

Overlays

Order Code	Size (cm)	Description
002251	30 x 50	XD1900™ Neonatal Overlay - Blue
005221	30 x 50	XD1900™ Neonatal Overlay - White
002169	30 x 70	XD1900™ Pressure Care Assistant™ - Blue
002244	45 x 75	XD1900™ Paediatric Overlay - Blue
003135	45 x 75	XD1900™ Paediatric Overlay - White
002756	50 x 140	XD1900™ Day Chair Overlay - Blue
005207	50 x 140	XD1900™ Day Chair Overlay - White
005153	50 x 140	XD1900™ Day Chair Overlay - Blue with Straps
005177	50 x 140	XD1900™ Day Chair Overlay - White with Straps
003098	65 x 100	XD1900™ Single Overlay – White
002701	65 x 100	XD1900™ Single Overlay – Blue
010003	63 x 92	Shear Comfort™ Natural Overlay - Green
003111	75 x 125	XD1900™ Classic Overlay - White
003067	75 x 125	XD1900™ Classic Overlay - Blue
002015	75 x 125	Shear Comfort™ Classic Overlay - Green
002718	75 x 150	XD1900™ Superior Overlay - White
002633	75 x 150	XD1900™ Superior Overlay - Blue
002022	75 x 150	Shear Comfort™ Superior Overlay - Green
002640	75 x 180	XD1900™ Regal Overlay - White
002602	75 x 180	Shear Comfort Regal Overlay - Green
002190	92 x 187	XD1900™ Full Single Bed Overlay - White
002213	137 x 187	XD1900™ Double Bed Overlay - White
002237	150 x 200	XD1900™ Queen Bed Overlay - White

Improved sleep quality

As far back as 1984, Dickson showed that a wool underlay decreased restlessness and improved sleep quality. Individuals with fibromyalgia, suffering from diffuse chronic pain and tender muscles, showed significant pain reduction and improved sleep quality when using wool overlays (Kiyak et al, 2009).



Dickson, PR (1984) Effect of a fleecy wool underlay on sleep, *Med J Austr* **140**, 87-89.

Kiyak, E et al (2009) The evaluation of the impact of the use of wool in patients with fibromyalgia on life quality *Aust J Adv Nurs* **26**, 47 -52.

Powley, M. et al (1980) Nursing jaundiced babies on lambskin *The Lancet* **315**, 979-980.

Scott, S. et al (1983) Weight gain and movement patterns of very low birthweight babies nursed on lambswool *The Lancet* **322**, 1014-1016.

Scott, S. & Richards, M. (1979) Nursing low-birthweight babies on lambswool *The Lancet* **313**, 1028.

Targetted Protectors

Certain areas of the body are at higher risk of developing pressure ulcers or skin breakages due to thin skin and/or boney protuberances, such as at the elbows, heels, ankles, sacrum, and under the buttocks. We have a range of specially designed products to target protection of these areas.



Neck Collar

Individuals with weak neck muscles, and asymmetric head positioning have a tendency for the head to fall forward or sideways, and are thus unable to keep their head in a neutral position. This not only affects functional activities such as eye contact, breathing, swallowing, etc., but can also lead to skin excoriation due to sweat build-up under the neck. The Shear Comfort™ **Neck Collar** is a firm, but gentle support that helps keep the neck in a neutral position. The **Neck Collar** is comfortable and hypo-allergenic, even with prolonged skin contact. Available in green Shear Comfort™, or blue XD1900TM



Palm Protectors

Our ambidextrous **Palm Protectors** are ideal for those who need to support their weight frequently with their hands, or those who have Dupuytren's contractures. The **Palm Protectors** are put on over the thumb and secured with a Velcro® strap around the back of the hand.



Elbow Protectors

The **Elbow Protectors** are designed in a 'one size fits all' style with the seams facing outwards to ensure the greatest comfort and protection. Shear Comfort **Elbow Protectors** fit snugly around the elbows, creating a shielded area for healing and protection against knocks. **Elbow Protectors** can be used to warm aching elbow joints, protect the elbows from injury, or shelter them during healing.

Knee Protector

The Shear Comfort XD1900™ **Knee Protector** is designed for people in supine positions for extended periods, who are immobile and lack the ability to reposition themselves effectively, or those who lie on their side with their knees in close contact due to contractures. The **Knee Protector** places wool against the skin, and the material backing provides protection against abrasion with other tissues. The Velcro® straps allow for size adjustment. The **Knee Protector** can be used singly, or with one on each knee.

Heel Protectors

Shear Comfort™ Heel Protectors shield the skin on the heels and ankles in this at-risk area, and provide protection for existing damaged skin. The wool layer wraps around the heel and ankle, leaving the rest of the foot free to move. Seams are positioned on the exterior of the protector to relieve the skin from areas of high pressure. The Velcro® straps give plenty of room for adjustment. We offer Heel Protectors in pairs which are designed in a style with no seams facing anywhere near the bones or tendons of the ankle. To provide comfort and protection to the individual foot, our Shear Comfort™ Total Foot Protector is also available.



Palm Protectors (single)

Order Code	Description
003074	XD1900™ Palm Protectors - Blue (Single)

Elbow Protectors (pair)

Order Code	Description
003302	XD1900™ Elbow Protectors (Pair) - Blue

Heel Protectors (pair)

Order Code	Description
002268	XD1900™ Heel Protectors Small - Blue
002275	XD1900™ Heel Protectors Medium - Blue
002282	XD1900™ Heel Protectors Large - Blue

Total Foot Protector (single)

Order Code	Description
005252	Total Foot Protector (Single)

Knee Protector (single)

Order Code	Description
005245	XD1900™ Knee Protector - Blue (Single)

Neck Collar (single)

Order Code	Description
001568	Shear Comfort™ Neck Collar - Green (Single)
005269	XD1900™ Neck Collar - Blue (Single)

Washing Infection Prevention

In any healthcare institution, infection prevention and cleanliness are of the utmost importance.

Our natural sheepskin products have been manufactured to AS4480.1 which means they can be washed a minimum of 30 times at 80°C (the temperature required to kill off the majority of bacteria within a minute) with a wool wash shampoo. We offer a suitable shampoo, with added tea tree oil, with its anti-dust mite properties. We have also thought about the needs of institutional laundries when developing XD1900™ as all our XD1900™ products can be washed at 80°C and over. Thanks to XD1900™ not having the leather backing of a natural sheepskin, normal detergents can be used.



Shampoo

Order Code	Description
002527	Wool Shampoo 250 ml Bottle
000905	Wool Shampoo 1 Litre Bottle

Evidence

Clinical Evidence

wool based products for tissue integrity

Unlike the large amount of anecdotal evidence around different means to reduce the incidence of pressure ulceration, there have been randomised clinical trials showing the benefits of medical sheepskin.

Three randomised clinical trials (RCTs) have been published recently which have demonstrated a positive impact on pressure ulcer (PU) rates comparing a significant number of patients using medical grade sheepskins vs those without:

- Mistiaen et al (2010) demonstrated a significant reduction of PU rates from 14.7 to 8.9 % in a RCT with 588 subjects
- Jolley et al (2004) in an open label randomized trial with 441 subjects

demonstrated a 16.6 % risk of PU without sheepskin vs 9.6 % with a medical sheepskin (CL 95 %)

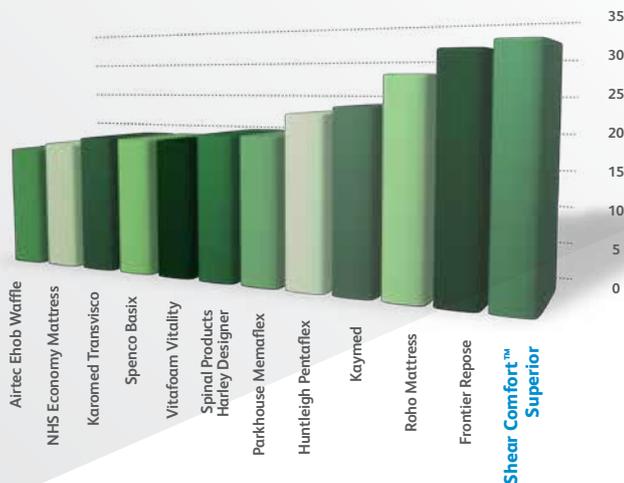
- McGowan et al (2000) showed in a trial with 297 subjects, a reduced PU rate of 9 % on medical sheepskin, as compared with 30 % for those without.

However, as Stacey (2004) proposed, no individual strategy or device will completely resolve PU incidence. It is therefore appropriate to consider the physical properties that contribute

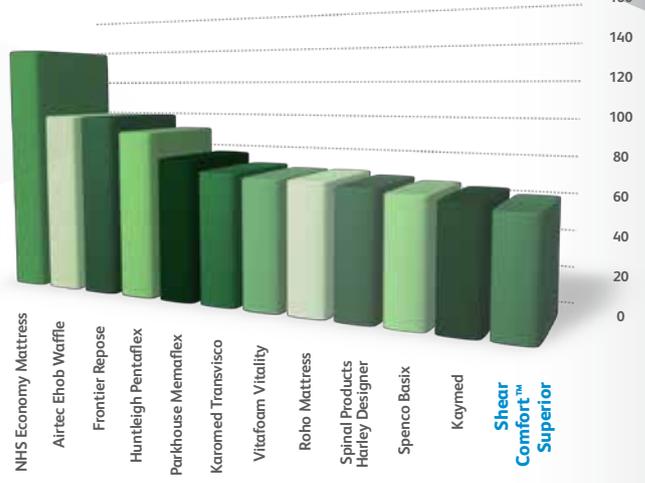
to the observed beneficial effects of sheepskin in PU prevention. Current views are that shear, heat, and water vapour, are significant contributing factors, together with pressure, in causes of tissue breakdown (NPUAP and EPUAP, 2009). Bain et al (2004) showed that natural sheepskin was comparable with plastic air-filled products for pressure redistribution, but had much better characteristics in relation to heat and water vapour dissipation.

(Bar charts below: Bain, D et al (2004))

Heat Transfer (Wm^{-2}) Ranked

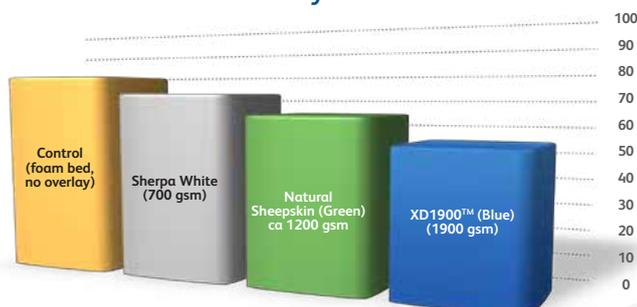


Heel Peak Interface Pressure (mmHg) Ranked



Call et al (2010) confirmed these physical characteristics (which have a relevance for clinical benefits for tissue integrity) of natural sheepskins, but also the greater benefits of Shear Comfort XD1900™ material in, for example, reducing the relative humidity against the skin.

% Relative Humidity at Indenter Interface



Bain, D et al (2004) Pressure reducing overlays. *MHRA Evaluation Reports* MHRA 04101-0.

Call, E et al (2010) ISO 16840 testing for Shear Comfort XD1900™ skin care material *Proc EPUAP* Sept 2010.

Jolley, DJ et al (2004) Preventing pressure ulcers with the Australian Medical Sheepskin: an open-label randomised controlled trial. *Med J Aust* 180,324-327.

McGowan, S et al (2000) The role of sheepskins in preventing pressure ulcers in elderly orthopaedic patients *Primary Intention* 8, 127-134.

Mistiaen, P et al (2010) The effectiveness of the Australian Medical Sheepskin for the prevention of pressure ulcers in somatic nursing home patients: a prospective multicenter randomized-controlled trial *Wound Repair Regen* 8, 572-9.

National Pressure Ulcer Advisory Panel and European Pressure Ulcer Advisory Panel (2009) Prevention and treatment of pressure ulcers: clinical practice guidelines *National Pressure Ulcer Advisory Panel*.

Stacey, MC (2004) Preventing pressure ulcers *Med J Austr* 180, 316-318.



FAQs

Can wool products be washed, and at high enough temperatures to kill bacteria?

Shear Comfort™ products can be washed at up to 80°C, or over 80° C for XD1900™ time and again – see ‘Washing – Infection Prevention’ section on p13.

Isn't wool an outdated form of tissue protection?

Sheepskins had been used for years before more recent plastic based products appeared, the latter being perceived as easier to disinfect. The new wool treatment standards have meant that the infection control concerns were able to be put to bed, so to speak. Recent research has emphasised that the relative importance of the microclimate at the skin is particularly important for skin integrity, and high density wool products give better protection than synthetic materials.

Isn't wool itchy?

This can be down to the wool fibre coarseness and to the presence of lanolin. We remove all lanolin from the wool and use a fibre size that is soft and relatively smooth to the touch.

I've seen guidelines against the use of sheepskin.

There have been guidelines deprecating the use of sheepskin. This recommendation related only to **synthetic** sheepskins, and rightly so in that their fibre density has not been sufficient to redistribute pressures, nor give the microclimate benefits. All of our products meet and surpass the Australian Medical Sheepskin standard, AS4480.1.

Aren't some people allergic to wool?

People can sometimes have an allergic reaction to the lanolin in wool, but in all our products the lanolin is removed. There is little or no evidence to show that people are allergic to wool itself (Fischer (1973); Hatch & Maibach (1985); Moscato et al (2000).

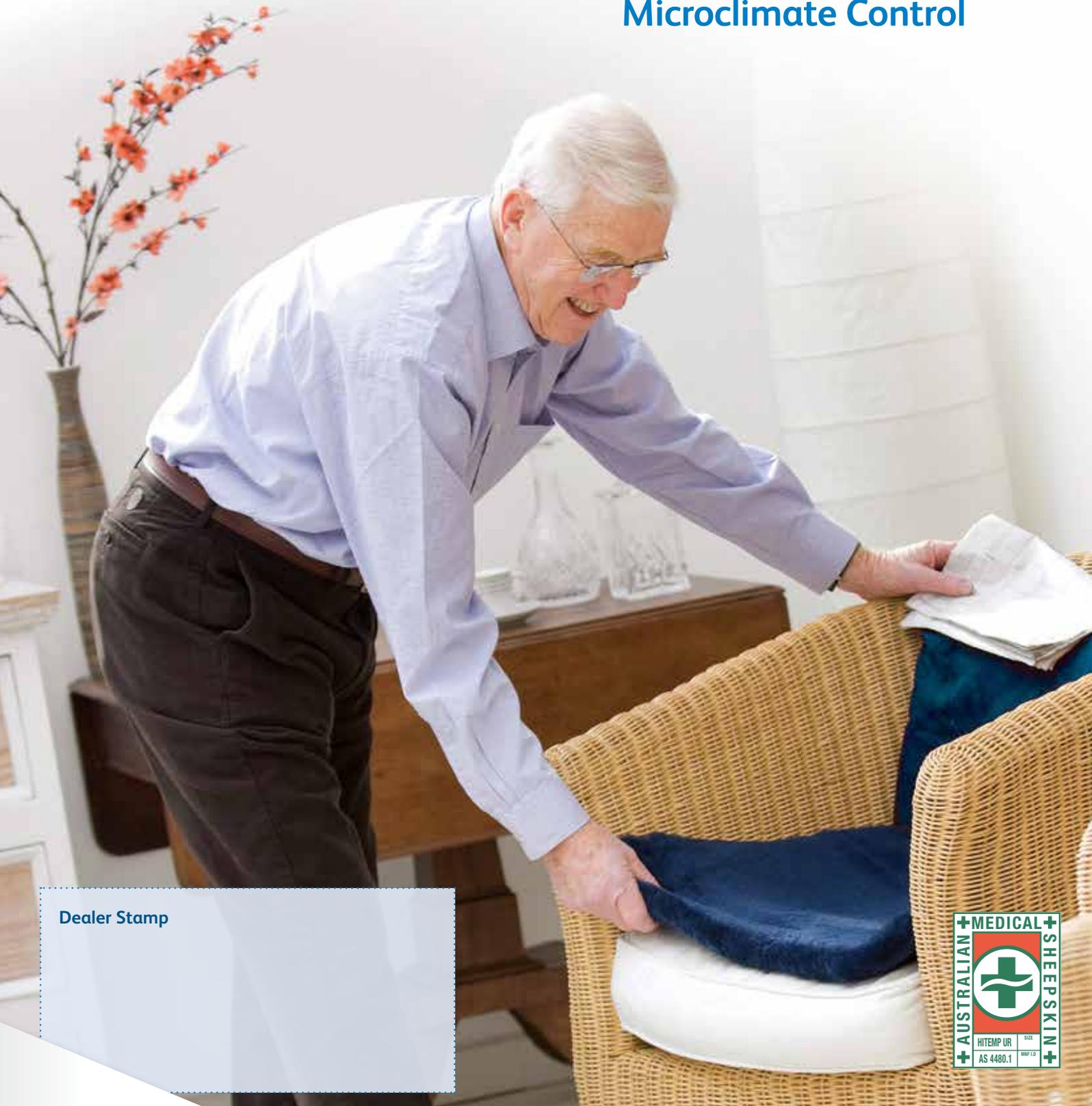
Fischer, AA (1973) Contact Dermatitis, 2nd Edition, Lea and Febiger, Philadelphia, 135.

Hatch, KL & Maibach HI.(1985), Textile Fibre Dermatitis, *Contact Dermatitis*, 12, 1-11.

Moscato, G, et al (2000) A respiratory and allergy survey in textile workers employed in early stages of wool processing, *G. Ita, Med Lav Ergon* 2293, 236-40.

Natural Wool

Microclimate Control



Dealer Stamp

