

# Softform

*Mattresses and Accessories*

**TECHNICAL BULLETIN**



**Yes, you can.®**

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## The Importance of Shear and Friction

A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated (European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel, 2009).

The Invacare Softform range offers a complete solution to effective pressure reduction management. Designed in consultation with clinical professionals, these products are constructed from high specification materials to meet the demands of modern healthcare environments.

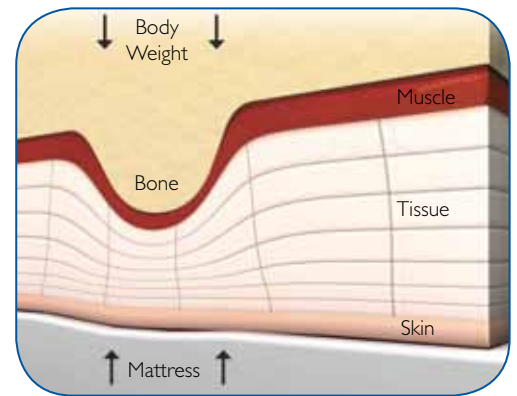
### What are the causes of pressure ulcers?

Pressure ulcers develop as a response to external forces causing localized ischemia (a restriction in blood supply). It is generally believed that external forces from direct pressure, shear and friction over bony prominences cause stresses and strains on the tissue. These stresses and strains occlude circulation, reducing oxygen and other vital nutrients reaching the tissue. Lymphatic drainage is also thought to be impaired, causing a build of metabolic waste.

### Direct Pressure

Pressure can be calculated by dividing weight by support surface area, hence the greater the support area, the lower the pressure. The pressure from a mattress when lying or sitting compresses skin and tissue between the surface of the mattress and the bony parts of the body.

When skin and tissue is compacted between these two surfaces capillaries get compressed preventing them from carrying oxygen and other vital nutrients to the tissue.



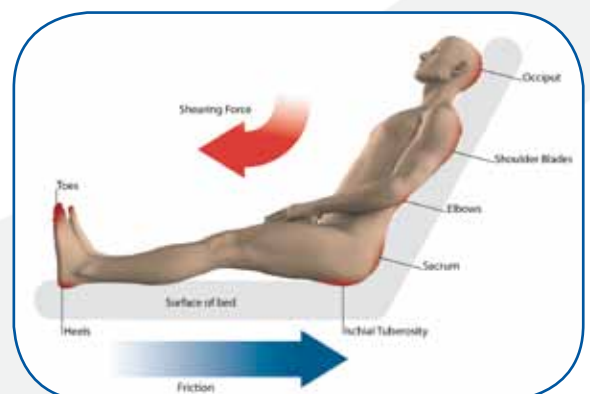
Pressure can be calculated by dividing weight by the support surface area, hence the greater the support surface area, the lower the peak pressure. Peak pressures can contribute towards the development of pressure ulcers. The more an individual is able to immerse into a mattress without bottoming out (squashing flat), the more potentially damaging peak pressure will be reduced.

### Shear Forces

Shear forces are parallel forces, sometimes described as stretching forces, caused by the effects of gravity. When an individual slides down, or is dragged up a bed or chair, shear forces pull on the skin. When this occurs, the upper layers of skin can be pulled away from deeper layers of skin and tissue causing damage. This stretching force can rupture capillaries, thus causing localised tissue damage.

### Friction

Friction is a type of shear force that is limited to the skin but can damage the epidermis and result in a superficial ulcer (Bader et al, 2005). Friction is commonly defined as the resistance present when one material rubs against another e.g. the rubbing of a bed sheet against the skin. This commonly occurs when individuals slide down the bed or chair causing skin abrasions or blisters.



### Moisture and Temperature

When moisture is trapped against the skin for prolonged periods of time, it will turn white becoming softer and more prone to breakdown. This is known as maceration. Sweating and incontinence can contribute to the development of pressure ulcers through maceration. Moist skin also increases resistance to parallel forces, therefore increasing exposure to the potential damaging effects of shear and friction.

European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. Prevention and treatment of pressure ulcers: quick reference guide. Washington DC: National Pressure Ulcer Advisory Panel; 2009.

## Why is considering Shear and Friction so important when selecting a mattress?

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Shear is a very important contributing factor in the development of pressure ulcers but is often overlooked because of the difficulty in accurately measuring the impact of shear forces on skin tissue. Shear can also make skin tissue more vulnerable to the forces of direct pressure. For this reason, a mattress's ability to redistribute pressure is only part of its role in pressure ulcer prevention. A clinically effective mattress should be constructed to reduce the effects of shear on skin tissue.

Experiments on pig skin tissue have shown that tissue damage can occur more quickly as shear forces increase. These experiments have also determined that tissue breakdown can occur at lower levels of direct pressure as shear forces increase (Bader et al 2005). This is thought to occur because as shear increases, the pressure required to occlude blood vessels also decreases, resulting in an increased risk of pressure ulcers.

## How does Softform Help to Reduce Shear Forces to the Skin?

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### Cover Material

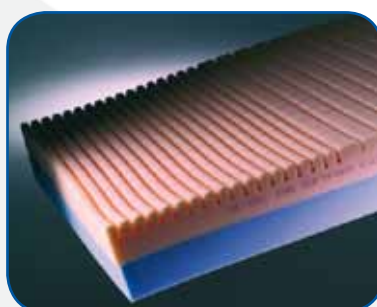


When the skin or the support surface is moist, the contact area becomes more resistant to movement, resulting in skin tissue "sticking" to the mattress surface. This significantly increases the potential of damage to the skin tissue through shear and friction. For this reason all Softform mattresses use a cover material that is vapour permeable, which minimises the build up of moisture.

### Foam Cell Design

Many mattress manufacturers cut castellations into the foam in order to break up the surface tension and increase the mattress's ability to redistribute pressure. The design of these castellations is fundamental to determine if the mattress will also successfully absorb shear forces.

Softform is unique in the way keyhole cuts are made into the foam. The size of each foam cell and the design of the key hole cuts allow the mattress to absorb shear forces, thereby reducing the risk of pressure ulcer development.



# Softform

The size of each foam cell in the Softform range has been specifically designed to accommodate bony prominences. If the cells are too large they will not effectively redistribute pressure away from small bony prominences. This is why Softform has smaller cells at the head and heel ends of the mattress.



“Mushroom shaped” foam cells

The design of the keyhole cut creates a “mushroom shaped” foam cell. This shape allows each cell to move with the client, absorbing shear forces. The keyhole cuts allow the cells to reduce the transmission of shear forces into the skin in a way that straight cuts are unable to achieve.

## Profiling Beds







Softform Premier Glide  
on a profiling bed

When the head of a profiling bed is raised, there is a downward pull on the skeleton due to gravity. The patient’s skin tissue, which is in contact with the support surface of the bed, will not slide easily as there will be resistance between the skin and the contact surface, resulting in a localised stretching force on the skin and tissue (Romanelli et al 2006). Friction will also occur when there is resistance between two surfaces such as sliding down the bed.



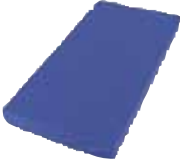

When using a profiling bed, it is advisable to initiate the knee break first to minimise the effects of gravity on the body when the head end is raised. The Softform Premier Glide mattress is designed specifically for profiling beds and effectively reduces the forces of shear and friction on the user.

Bader, Dan et al. Pressure Ulcer Research: Current and Future Perspectives. Springer. 2005  
Romanelli, Marco et al. Science and Practice of Pressure Ulcer Management. Springer. 2006

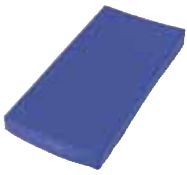



## Overview of the Invacare Softform Range

	Product	Description
	Softform® Premier	The Softform Premier Mattress delivers exceptional levels of comfort and pressure reduction, suitable for those considered at “High/ Very High Risk” of developing pressure ulcers. The Mattress features a deep ‘keycut’ contoured foam insert that maximises the body contact area and optimises pressure reduction. Weight limit: 39 stone/247.6 kg
	Softform® Premier Glide	The Softform Premier Glide positively contributes to a reduction in shear and friction forces when used in conjunction with an electric profiling bed. The patented design allows the top surface to retain its optimum properties for effectively supporting the client, while the base of the mattress separately conforms to the bedframe. The mattress is suitable for those considered to be at ‘Very High Risk’ of developing pressure ulcers. Weight limit: 39 stone/ 247.6 kg
	Softform® Premier Active	The Softform Premier Active features an alternating air insert beneath the castellated foam of the tried and trusted Softform Premier mattress. The mattress retains its properties as a ‘High/ Very High Risk’ static surface giving the option to step up from a static to a dynamic surface without the need to transfer the client. Weight limit: 39 stone/ 247.6 kg
	Softform® Premier Visco	The Softform Premier Visco features a high density visco elastic (memory) foam insert which is temperature sensitive to the body, allowing it to conform to the body shape. Suitable for those considered at ‘High Risk’ of developing pressure ulcers, the mattress provides exceptional comfort and facilitates pressure reduction. Weight limit: 39 stone/ 247.6kg

## Overview of the Invacare Softform Range


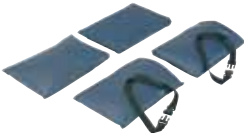
	Product	Description
	Softform® Excel	The Softform Excel provides a high level of comfort, suitable for those considered 'At Risk' of developing pressure ulcers. The mattress features robust high density foam with the core constructed from 'keyhole cut' cells which move independently to evenly distribute weight. Weight limit: 22 stone/ 140kg
	Softform® Premier Spinal	The Softform Premier Spinal offers a suitable surface for those with newly acquired spinal injuries. The high quality foam offers a superb level of support for 'At Risk' patients. Weight limit: 39 stone/ 247.6kg
	Softform® Cot Mattress	The Softform Cot Mattress is a 'Low Risk/ Comfort' mattress with no chemicals or minerals in the cover or foam (a 'High Risk' option is also available). The mattress provides excellent recovery and durability and helps reduce shear and friction forces. It can be customised up to 89cm x 140cm.
	Softform® New-born Mattress	The Softform New-born Mattress has the same qualities as the Cot Mattress but can be customised up to 50.8cm x 86.4cm for 'Low Risk/ Comfort' patients.

## Overview of the Invacare Softform Range

	Product	Description
	Softform® Incubator Pad	The Softform Incubator Pad also has the same qualities as the Cot Mattress but can be customised up to 122cm x 71cm for 'At Risk' patients.
	Softform® Birthing Mattress	The Softform Birthing Mattress has been designed to aid pressure reduction and to be highly durable for 'At Risk' patients. For added assurance in infection control, all seams are manufactured with an extremely strong 10mm wide, high frequency weld and audit inspection zips. Weight limit: 39 stone/ 247.6kg
	Softform® A&E Trolley Mattress	The Softform A&E Trolley Mattress has an ergonomically designed profiled surface offering significant reduction of pressure and shear & friction forces for 'At Risk' patients. The features combine to effectively reduce the potential incidence of pressure ulcers in the A&E department. Weight limit: TM20 & TM40 – 17 stone/ 108kg TM60 – 22 stone/ 140kg
	Softform® Heelpad	The Softform Heelpad is designed to reduce pressure on the vulnerable heel area. The controlled volume of gel in the sacs allows pressure displacement and even weight distribution. The heelpads are available in single or double sizes.



## Overview of the Invacare Softform Range

	Product	Description
	Softform® Odstock Wedge	The Softform Odstock Wedge was developed to assist in the reduction of interface pressures on the sacrum and heels without significantly increasing pressure on the thighs or calves. The design improves and maintains patient posture in the recumbent position and is ideal when used with the Heelpad.
	Softform® Flexipad	The Softform Flexipad is a highly versatile pad filled with silicone gel, used to position and support limbs, joints, the torso or the head. Available in single, double or ultra, the flexipad provides supplementary short-term support for patients experiencing difficulty in maintaining posture.

## The Static-Led Approach

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For over 20 years, supported by independent clinical studies, the unique qualities of the Softform mattresses have been proven to be highly effective pressure-reducing surfaces, especially when operated within the principles of the Static-Led Approach. The Static-Led Approach was developed following many years of working closely with Clinical Nurse Specialists to understand their concerns, needs and working practice towards optimising pressure care within a clinical environment.

In the years prior to 2002, concerns stemming from increasing awareness of the prevalence of pressure ulcers had progressively led hospitals to significantly increase their selection and deployment of dynamic mattress systems. This was partly due to the clinical information made available at that time and partly through fear of litigation. The prevailing view was that dynamic surfaces offered a near-complete protection against the formation of pressure ulcers and the wide deployment of dynamic mattresses within a hospital or clinic would result in a significant reduction in the occurrence of pressure ulcers. However, the investment in widespread deployment of high-cost dynamic systems placed a heavy burden on the financial resources of many hospitals and in many cases, this investment did not produce the anticipated reduction in the incidence of pressure ulcers. As a consequence, clinical personnel started to review their mattress stock.

From this, it was recognised that low quality economical foam mattresses were invariably used as a basic standard mattress throughout a hospital. High-end dynamic systems were then deployed both to address existing pressure ulcers and to nurse patients who had developed pressure ulcers while on a low quality economical foam mattresses. This has now become widely recognised as the 'fire fighting approach'.

The Static-Led Approach has been developed in conjunction with clinicians as a means of delivering excellent nursing care while managing available budgets. By investing in a high quality static mattress (e.g. the Softform Premier mattress) and making this mattress the standard to be used for all patients, including those who are at high risk of developing pressure damage, clinicians could create a platform for a significant reduction in the need to deploy dynamic mattress systems. In order to be wholly successful, the introduction of a high quality static mattress as the standard product must be supplemented with a programme of essential nursing care and effective equipment management. Clinical studies\* show that the successful introduction of these three factors, which effectively make up the Static-Led Approach, can result in a reduction in the incidence of pressure ulcers.

The Static-Led Approach has now been adopted and successfully implemented by a number of hospitals allowing them to nurse patients up to and including 'High Risk' pressure damage on the Softform Premier static mattress. Dynamic mattress systems are still used but only to address extreme cases that require intensive nursing care.

Although the initial investment in introducing mattresses from the Softform range is invariably higher than using cheaper foam mattress products, the performance and longevity of the Softform mattress range, coupled with the Static-Led Approach, can not only reduce the incidence of pressure ulcers but also offset the long term costs.

### \*References

Pressure Area Management: a static-led approach by Janet Thomas, Jane James published in the British Journal of Nursing, 2002, Vol 11, No14, pp 967-976

A static-led approach to pressure ulcers: an evaluation after 3 years by Jane James published in the British Journal of Nursing, 2004, Vol 13, No20

A static-led approach to effective equipment management by Jenny Sale published in the British Journal of Community Nursing, 2005, Vol 10 No. 12 pp S25-S30.

## A Summary of “Strikethrough”

### What is strikethrough?

Strikethrough occurs when urine, blood or any other bodily fluids penetrate the outer cover of the mattress contaminating the inside.

### How do I know if strikethrough has occurred?

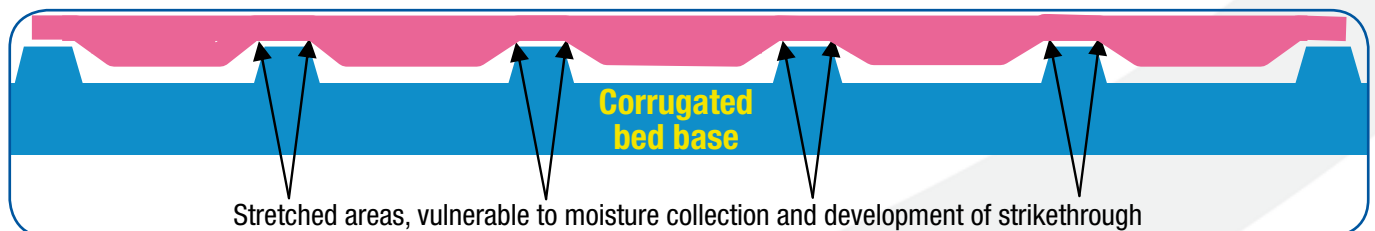
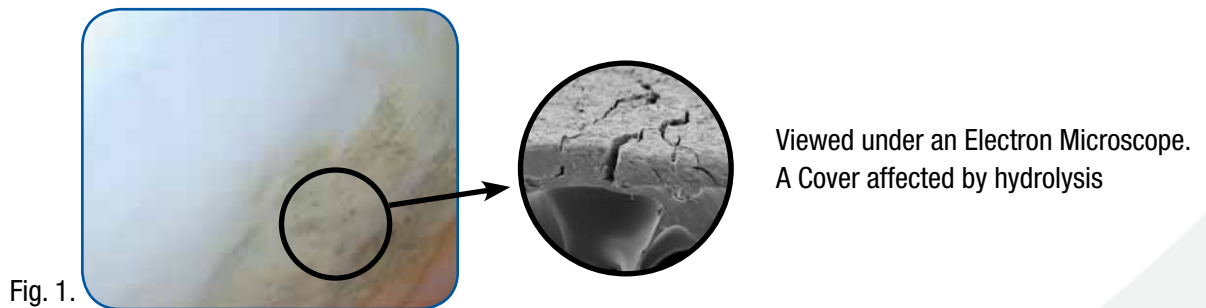
Mattress covers should be inspected regularly. This would normally occur as part of an audit undertaken at least annually. Strikethrough is often difficult to identify just by looking at the outside of the cover, however, inspecting the inside, (which should be white) will reveal all stains, large or small.

### How does strikethrough occur?

#### 1. Breakdown caused by hydrolysis

Hydrolysis is the resulting effect of the Polyurethane’s chemical reaction with water which causes the surface to break down and eventually allows fluids to pass through.

Fig 1 shows staining typical of a mattress where strikethrough has taken place through the action of hydrolysis.



As with other products, a flip’n’rotate mattress is designed to conform to the contours of the body. Similarly, it will do the same to any corrugated bed base.

If the mattress and bed base are not cleaned and dried regularly, the Polyurethane becomes vulnerable in the stretched areas highlighted in the above illustration. Hydrolysis can begin immediately upon contact with a damp bedframe and cause strikethrough within weeks.

### The answer to this problem:

Use a mattress which features a toughened non-stretch base. This should prevent hydrolysis from occurring.

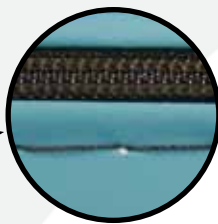
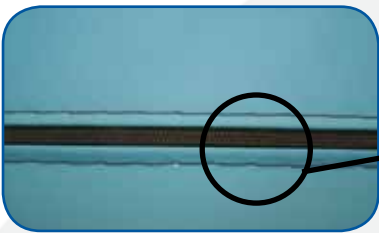
## 2. Leakage

As evidenced by:

- Fluids penetrating through the zip
- Fluid ingress through the sewn seams
- Inadequate Polyurethane coating



A mattress Zip **should be covered with a flange** to protect from fluid ingress and where possible, **moulded** to give enhanced protection. The zip should be **welded, not sewn, onto the cover.**

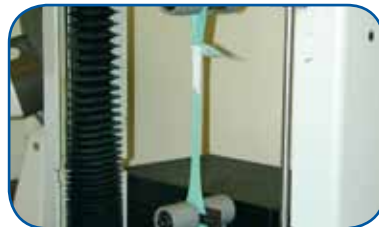


A sewn seam does **NOT** provide protection against fluid ingress

**All mattress covers should be thoroughly tested:**



Martindale test  
(Abrasion testing)



Peel bond strength  
(Delamination testing)



Static head pressure  
(Porosity testing)

Not all manufacturers supply mattresses with adequate Polyurethane coating and bond strength.

Invacare Softform mattresses are subjected to all the above tests to ensure their strength and durability.

**To avoid problems with mattress leakage:**

Use welded seams and zips throughout the mattress, this provides complete protection against fluid ingress.

## 3. Inappropriate cleaning (for further information see page 4)

Although incorrect cleaning protocols are not seen as a primary source of delamination, they can accelerate any inherent damage.

- Do not use Phenols or Alcohols
- Do not use undiluted cleaning agents
- Follow the manufacturers' recommendations
- Always rinse and dry the mattress cover after cleaning

## 4. Physical damage

Whilst every care may be taken to protect the mattress cover in use, unfortunately they can at times be damaged accidentally. The causes of such damage can stem from a number of sources:



Worn or damaged bed frames



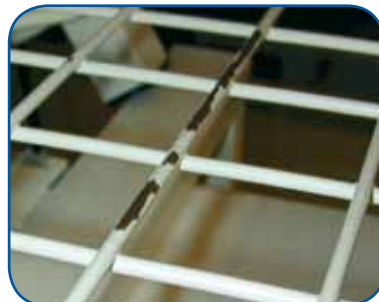
Cot side damage



Needles / Venflons



Manual Handling Equipment



Bed base



Jewellery






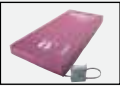



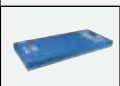
Mattresses need to be protected where possible from this type of damage through innovative design and the use of durable materials, as well as correct usage.

A well-designed clinical mattress will incorporate features designed to minimise the potential for damage.







### These features should include:

- A toughened non-stretch base to minimise potential damage caused by bed cradles
- Design out the need to allow the mattress to dry before turning over
- Design a cover with light internal colouring to allow ease of inspection
- Double-coated side panels to reduce the potential damage caused by cot sides (If the outside is damaged then the foams remains protected)
- Foam interiors that have good pressure, shear and friction reducing properties whilst not contouring to the bed base. (Castellations with keyholes)
- A welded and moulded zip cover covered with a flange (this should minimise ingress through the zip)
- Seams that are welded, not sewn, to avoid fluid ingress
- Minimise manual handling by using a non-flip 'n' rotate mattress

## Mattress Segmentation Chart

	Minimise Peak Pressure and Shear Forces				
	Softform Castellations	Glide Mechanism	Active Mechanism	Tapered Heel Zones	Visco Elastic Foam
<b>Clinical Application</b> <p>The Softform cell castellations break the surface tension of the foam. This allows the patient to be immersed into the foam, maximising body contact area and optimising pressure redistribution. The unique shape of the foam castellations allows them to move with the body, significantly reducing shear and friction</p> <p>Unique Patented Glide system allows the mattress to fully conform simultaneously to the client and bedframe, optimising the properties of a profiling bed. This significantly reduces shear and friction forces, particularly in the heel and sacral areas.</p> <p>The air insert, which alternates on a 10 minute cycle, can be introduced easily and quickly through connection to a portable pump. Eliminates manual handling issues related to client transfer to a traditional dynamic. Simple step up/step down system minimises any potential issues with Tissue Tolerance.</p> <p>Tapered heel zones to help further reduce direct pressure to the heels which can be particularly vulnerable to tissue breakdown.</p> <p>Visco elastic foam is high density and temperature sensitive, warming to the users shape. This enhances the body contact area and facilitates pressure redistribution.</p>					
<b>Softform Premier Active</b> 	✓		✓		
<b>Softform Premier Glide</b> 	✓	✓			
<b>Softform Premier</b> 	✓				
<b>Softform Premier Visco</b> 					✓
<b>Softform Excel</b> 	✓				

# Softform

Infection Control	Minimise Manual Handling Requirements		Maximise User Independence		Bariatric
High Frequency Welded Seams	Non Rotation	Optional Carrying Handles	Single Piece 'U' shaped Core	High Quality CMHR Foam	Weight Limit of Up to 247kg
<p>High Frequency Welded seams dramatically reduce the risk of fluid ingress, contributing towards excellent infection control. Mattresses with High Frequency Welded seams also have a full length zip flap to further reduce the risk of fluid ingress.</p>	<p>The mattress itself does not need to be turned, therefore reducing the need for unnecessary moving and handling, in turn reducing workload and risk to staff.</p>	<p>Handles are on one side of the mattress only, intended to ease transportation of the mattress alone (not for patient evacuation).</p>	<p>Facilitates patient transfer by providing effective side wall support. By manufacturing the core out of one piece of foam, rather than glued sections, strength and durability are maintained.</p>	<p>Individuals with restricted movement find high quality "standard" foams much easier to move about on than the soft, high conforming visco elastic foams.</p>	<p>With a high upper weight limit and no lower weight limit, a wider range of patients can be accommodated.</p>
					
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓		✓
	✓	✓		✓	

## Selecting a Mattress for the Clinical Environment

Selecting a pressure-reducing mattress that appropriately addresses the exact needs of the modern clinical environment of a hospital ward, long term care home or the complexities of home care environments, will raise a number of questions. A clinical mattress has to address Pressure Area Care, Infection Control and Moving and Handling issues, as well as satisfying the budget limits for mattress replacements.

So if you are looking to purchase a new clinical mattress, what are the key things you should be looking for? Here are a number of questions you should be asking your mattress supplier in order to ensure that you get the best clinical and cost effective solution:

### Pressure Care

How can you ensure your mattress redistributes pressure and addresses shear and friction?	Castellated foam surfaces allow the patient to be immersed into the foam to maximise body contact area, therefore optimising pressure reduction and redistribution. The individual movement of each castellation can significantly reduce shear and friction forces.
Can you ensure the pressure reducing qualities of the mattress are effective for the lifespan of the product?	High quality foams ensure a good life span and reduce the possibility of the mattress bottoming out. A mattress supplier should be able to present you with strong evidence that their foams are high quality and will deliver a long lifespan. Avoid cheap foam mattresses – they are a false economy. Cheap foam will collapse after a short period of use and you will need to replace them again and again. Using cheap foam mattresses may also put your patients at risk of developing pressure ulcers.
Does the cover material enhance or reduce the performance of the mattress?	A good mattress will feature Two-way stretch polyurethane (PU) waterproof cover fabric, which is designed to contribute to the reduction of shear and friction forces. Avoid non-stretch materials and materials which have poor vapour-permeability. Avoid cover materials which include Latex; Latex has poor allergenic properties; and some patients can be particularly vulnerable, leading to adverse skin reactions.
Does the mattress have independent supporting Clinical evidence?	Always ask for credible independent clinical evidence to support a mattress supplier's claims. Don't be taken in by being told that a mattress that looks the same will deliver the same performance as a competitor's clinically-proven mattress. Cheap imitations are common, but if the moment ever arises where you need to clearly demonstrate that your choice of mattress was based on sound clinical evidence, then you want to be sure you have the support you need from an ethical supplier company.
To glue or not to glue? Should sections of a mattress' foam core be glued together ?	Some mattresses (particularly low cost ones) use glue as an essential part of their construction, primarily to save cost. Glue should be avoided where possible, but if used, should be deployed sparingly. A mattress which uses a lot of glue to hold the foam core together will become rigid and inflexible, thereby significantly reducing the mattresses ability to conform to an electric profiling bedframe. This will reduce any pressure-reducing properties within the mattress, and may significantly increase the potential of skin tissue damage through shear and friction forces.



## Infection Control

<p>What features should a mattress have to help address the concerns of Infection Control?</p>	<p>The mattress cover should be waterproof and vapour permeable but should not allow bacteria through. These features will also help to prolong the longevity of the mattress and reduce the risk of strikethrough, hydrolysis and de-lamination.</p> <p>A detachable top cover will help allow regular inspection and ease of removal for laundering in cases of heavy contamination.</p> <p>A quality mattress will also feature a toughened PU coated base. This will help prolong the longevity of the mattress and reduce the risk of strikethrough, hydrolysis and de-lamination.</p> <p>Double Coated PU sides reduce the risk of damage to the cover, therefore prolonging longevity or damage from cot sides or other products, which may cause damage to the mattress, as well as strikethrough, hydrolysis and de-lamination.</p> <p>Mattresses which are destined for use in hospitals should have High Frequency Welded (HFW) seams as a mandatory feature. High Frequency Welded Seams significantly reduce the risk of fluid ingress and positively contribute to infection control policies.</p> <p>Concealed zips reduce the risk of fluid ingress through the zip.</p>
<p>Can the Mattress be easily cleaned?</p>	<p>The mattress should be able to satisfy all laundering requirements laid down by the Infection control department. Full laundering instructions should be clearly printed on the mattress cover.</p>
<p>Are replacement parts available for the Mattress?</p>	<p>A mattress with a modular construction allows damaged parts (covers, foam) to be replaced easily, thereby avoiding the need to replace the entire mattress, prolonging its life and saving money.</p>

## Moving and Handling

<p>Does the Mattress facilitate patient transfer and movement of the bed itself?</p>	<p>A good mattress will have a firm foam base to provide support to the load-bearing surface. Most importantly, a quality mattress should feature firm supporting side-walls, allowing for easier patient transfer.</p>
<p>How does the mattress reduce moving and handling issues for nurses?</p>	<p>A high quality mattress will not require turning, remaining in one position on the bed frame, eliminating the requirement for a regular mattress turning regime.</p> <p>A quality non-turn mattress will also have the positive benefit of reducing the potential of injury to carers (e.g. back strain), that can occur when manoeuvring a mattress.</p>

## Mattress Technical Specifications

PRODUCT	WARRANTY	FIRE TESTING	GRADE REF & COLOUR	NOMINAL DENSITY RANGE (Kg/M)	NOMINAL HARDNESS RANGE (N)	FATIGUE CLASS	WEIGHT OF PRODUCT (Kg)
<b>GLIDE</b>	4 Years Cover 8 Years Foam	BS 7177: Crib 5	Gr. RX 39/120 PINK Gr. RX 39/200 BLUE	38 - 40 38 - 40	105 - 135 180 - 200	Very Severe Very Severe	13
<b>PREMIER</b>	4 Years Cover 8 Years Foam	BS 7177: Crib 5	Gr. RX 39/120 PINK Gr. RX 39/200 BLUE	38 - 40 38 - 40	105 - 135 180 - 200	Very Severe Very Severe	13
<b>PREMIER VISCO</b>	4 Years *	BS 5852: Crib 5	Gr. RX 39/120 PINK Gr. RX 39/200 BLUE Gr. VC5580 WHITE	38 - 40 38 - 40 55	105 - 135 180 - 200 80	Very Severe N/A	13
<b>EXCEL</b>	2 Years	BS 7177: Crib 5	Gr. RX 39/120 PINK Gr. RX 39/200 BLUE	35 - 37 38 - 40	105 - 135 180 - 200	Very Severe Very Severe	10
<b>A&amp;E TOLLEY MATTRESS</b>	1 Year	BS 5852: Crib 5	Gr. RX 36/125 BEIGE Gr. RX 39/200 BLUE	35 - 37 38 - 40	110 - 140 180 - 200	Very Severe Very Severe	5,5
<b>BIRTHING MATTRESS</b>	1 Year Cover 4 Years Foam	BS 7177: Crib 5	Gr. RX 39/200 BLUE	38 - 40	180 - 200	Very Severe	15
<b>NEWBORN</b>	1 Year	BS EN 597-1, 2	Gr. C 28/100 WHITE	25 - 27	85 - 110	Average	0,5
<b>INCUBATOR PAD</b>	1 Year	BS EN 597-1, 2	Gr. C 28/100 WHITE	25 - 27	85 - 110	Average	0,5
<b>COT MATTRESS</b>	1 Year	BS EN 597-1, 2	Gr. C 28/100 WHITE	25 - 27	85 - 110	Average	2,7
<b>HEEL PAD</b>	1 Year	BS 5852: Crib 5	Gr. RX 33/125 WHITE	32 - 34	110 - 140	Severe	3
<b>ODSTOCK WEDGE</b>	1 Year	BS 5852: Crib 5	Gr. RX 33/125 WHITE	32 - 34	110 - 140	Severe	2,5

\* Standard Configuration

## Pressure Ulcer Risk Assessment

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When assessing an individual for a pressure relieving cushion or mattress it is always advisable to carry out some form of risk assessment. This risk assessment can include a formal risk assessment scale such as the Norton scale (1962), the Braden scale (1985) and the Waterlow scale (1985). The Waterlow scale for example provides a guide category of potential risk for that individual, based on the final score.

Category	Waterlow Score
At Risk	10+
High Risk	15+
Very High Risk	20+

However, it is recommended that the results of a formal risk assessment are always considered alongside more informal clinical judgement before the total care package is decided, of which pressure management equipment is an important part. This ensures that factors that may not be included in the formal risk assessment are given sufficient consideration.

In addition, Invacare recommend that guidance on pressure ulcer risk assessment is sought from relevant Agencies and Panels as detail below.

## References

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Norton, D., Exton Smith A.N., McLaren R. An investigation of geriatric nursing problems in hospital. London: National Corporation for the Care of Old People. 1962.

Waterlow, J. A risk assessment card. Nurs Times 1985; 81 (49);5115

Waterlow, J. The Waterlow pressure ulcer prevention manual. Taunton: Newtons. 2005.

Product	Waterlow Score
Softform Premier	30
Softform Premier Glide	25
Softform Premier Active	30
Softform Premier Visco	20
Softform Excel	15

## Care of Invacare® Softform Products

### Use

To prevent accidental cover damage, do not place hypodermic needles, venflons, scalpels or other similarly sharp objects onto the mattress.

### Cleaning (removal of contaminants such as dust and organic matter)

Use a solution of neutral detergent and hot water with a single use wipe to clean Invacare Softform products. Ensure that the cover is rinsed with clean water using a damp single use wipe, and thoroughly dried.










The removable outer cover can be laundered at 80°C using a dilute detergent solution.

### Disinfection (reduction of the number of micro-organisms to a level not harmful to health)

Ensure that any residual detergent has been removed prior to disinfection. A 0.1% Chloride Solution (1,000 ppm) can be used. Alternatively, where required, a 1% Chloride Solution (10,000 ppm) can be used. Ensure that the cover is rinsed with clean water using a damp single use wipe, and thoroughly dried.

Where combined cleaning and disinfection products are used, ensure that the cover is rinsed with clean water using a damp single use wipe, and thoroughly dried. Do not use Phenols.

### Symbol Guide

 Do not pierce or cut	 Do not dry clean	 Do not put near flame
 Wash at 80 °C	 Do not bleach	 User weight limit of 247 kg
 Cannot be tumble dried	 Do not iron	 Declaration of conformity

## Glossary of Terms

- **Ischaemia** – Localised deficiency of blood supply. In the case of Tissue Viability, ischaemia usually refers to occlusion due to pressure.
- **Tissue Tolerance** – The ability of the skin/tissue to tolerate pressure.
- **Occlusion** – To close, referring to the blockage or closure of blood flow through a vessel.
- **Reperfusion** – The restoration of (in this case) blood into the vessels following a period of occlusion.
- **Reperfusion Injury** – Relates to the risk of injury from repeated (rapid) reperfusion.
- **Reactive Hyperaemia** – Natural temporary red flushing that naturally appears on the skin following the removal of pressure.
- **Endothelial Cells** – The cells which line the inside of blood vessels (also lines the heart and lymphatic vessels).
- **Collagen** – A protein found in the skin, tendons, bone and ligaments. Although it is relatively inelastic it does have high tensile strength which is fundamental in pressure ulcer prevention.
- **Micro-circulation** - Denoting the smallest part of the circulatory system (i.e the capillaries) responsible for the delivery of nutrients and oxygen and removal of toxins to the tissues.
- **Capillaries** - Extremely narrow blood vessels, forming networks in most tissues. The vessel wall of the capillary is only one cell thick, enabling the exchange of oxygen and carbon dioxide.
- **Extrinsic Factors** – Factors that may contribute to a pressure ulcer, occurring as a result of external factors (e.g. poor support surface, shear & friction forces, temperature).
- **Intrinsic Factors** – Factors that may contribute to the development of a pressure ulcer, occurring as a result of factors specific to an individual, e.g. immobility, old age, illness, skin maceration or malnutrition.

## References

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**Bader, Dan et al.** Pressure Ulcer Research: Current & Future Perspectives, Springer, 2005

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**Waterlow, J.** The Waterlow pressure ulcer prevention manual. Taunton: Newtons. 2005.

## Resources

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The following resources are available to order from Invacare®:

Home Care Catalogue	1504613
Propad® Mattresses, Overlays & Cushions Brochure	1492218
Flo-tech® Pressure Reducing Cushions Brochure	1488709

### Posters

30 Degree tilt	1492224
Areas at Risk	1492636
Concepts of Chair Nursing	1492635
Mattress testing	1492637
Pressure Ulcer Grading	1522584
Repositioning Schedule Tool	1493306
Flo-tech Cushion Guide	1504269

### Clinical Papers

Softform Premier Active Mattress: a novel step-up/ step-down approach by Geoff Thompson British Journal of Nursing, 2006, Vol 15, No 18	1492692
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A clinical audit of the Softform Premier Active mattress in two acute care of the elderly wards by David Gray, Pam Cooper, Melvyn Bertram, Kirsten Duguid and Gail Pirie Wounds UK, 2008, Vol 4, No 4	1522791
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Pressure area management: a static led approach by Janet Thomas and Jane James British Journal of Nursing, 2002, Vol 11, No 14	1492850
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A static-led approach to pressure ulcers: an evaluation after 3 years by Jane James British Journal of Nursing, 2004, Vol 13, No 20	1504043
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Copies of the above papers and posters are available on-line. Please go to the Invacare® Limited website [www.invacare.co.uk](http://www.invacare.co.uk) and go to the Pressure care and positioning section. Alternatively you can order from Customer Services by e-mailing [ordersuk@invacare.com](mailto:ordersuk@invacare.com).

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