



# It's a Perfect Part of Me

The Importance of a Liner

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## The Basics:

# 3 Things to Know About Our Prosthetic Liners

### 1. Why Liners?

The importance of liners in prosthetic design cannot be overstated, particularly for individuals who have undergone amputation. A well-designed socket interface plays a crucial role in enhancing the overall user satisfaction. Here are three key benefits of using liners:

**Suspension:** Liners serve as an effective method of suspension, allowing for greater freedom of movement. This minimises the distractions caused by pistoning and rotation within the socket, enabling users to engage in daily activities with confidence.

**Protection:** Many amputees face challenges related to compromised skin and reduced elasticity, often due to conditions like vascular disease or diabetes. Össur's Iceross liners are specifically engineered to protect vulnerable skin from excessive loads and shear forces, helping to prevent sores and other skin issues.

**Comfort:** The residual limb often finds itself in the unfamiliar and sometimes uncomfortable environment of a socket. Iceross liners reduce movement within the

socket, enhance proprioception, and improve skin care, all of which contribute significantly to user comfort and compliance.

### 2. Why Silicone?

Össur's expertise in silicone technology offers numerous advantages for prosthetic users, particularly when using the Össur-Iceross® liner made from medical silicone. Here are the key benefits:

- **Versatile Blends:**

Patented Iceross production techniques create a range of silicone blends, from soft to stiffer. These blends address individual needs for tissue stabilisation and protect the residual limb by cushioning bony prominences and sensitive areas.

- **Exceptional Elasticity:**

Silicone can stretch by 6-10 times its original size, allowing for total contact and conformity to various limb contours. It acts like a second skin, helping to disperse pressure peaks and reduce shear forces.

- **Active Skin Care:**

Incorporation of active skin care ingredients, such as aloe vera, silicone oil, and menthol, keeps the skin hydrated and supple, promoting overall skin health.

- **Biocompatibility:**

Silicone is biocompatible and free of plasticisers and stabilisers, ensuring that it doesn't cause an allergic reaction and that it does not react negatively with the skin or substances like perspiration.

**Durability:**

Medical-grade silicone boasts high tear strength, significantly increasing the durability of the liner.

**Unique Features:**

The Össur-Iceross® liner is the only material that combines adhesion, hygiene, and dimensional stability, making it absolutely skin-friendly. It cannot be absorbed by the body or the skin, ensuring a safe interface.

**Shock Absorption:**

The liner has outstanding shock absorption characteristics that minimise shear forces acting on the skin of the residual limb and on scar tissue.

### 3. Why Iceross®?

In 1971, Icelandic prosthetist Össur Kristinsson decided to design and manufacture a revolutionary amputee attachment system. An amputee himself, he felt there was a gap in the market for an effective border between the socket and the skin of the residual limb.

Kristinsson called it the ICElandic Roll-On Silicone Socket – Iceross. He was a pioneer in the manufacturing of silicone liners for prosthetics, and a lot of his original design is still being used today.

Today, more than 50 years later, Össur remains an undisputed expert in the use and innovative application of silicone technology for prosthetic products.



Watch here the journey of our liners



The best psychological rehabilitation is finding yourself in a new life!

Roman







## How to Start? Take a Look at the Characteristics of Your Patient

### A Step-by-Step Approach

Choosing the correct liner for your patient starts with examining their unique characteristics and the condition of their residual limb. Factors such as limb shape, skin condition, activity level, and comfort requirements are essential for finding the best fit.

To support clinicians, we've created an intuitive liner selection tool that guides prosthetists through assessing patient-specific needs and stump characteristics, ensuring a precise and personalised liner choice.

Explore the selection tool to enhance your decision-making and improve patient satisfaction!



Try our liner  
selection tool

## Which Liner Suits Best? The Many Types, Characteristics and More

### What are the different types of liners?

In the former section, we covered how to select the right liner based on patient characteristics and limb condition. With a wide range of options varying in suspension methods, thickness, material, and design, you can match each liner's features to the patient's activity level, skin sensitivity, and mobility needs. Ready to explore the options in more detail?





# Suspension Options for Prosthetic Liners

How a prosthetic liner fits to a body depends on how it is suspended. There are different options to choose from.



1.

## Distal connection (Pin liners) For better control & safety

Liners with a distal connection, often referred to as pin liners, are connected to the prosthesis using a hook-and-loop, cord retractor, or pin. The system is perceived by users as a very safe and secure connection.

These liners are ideal for residual limbs of short to medium length and for users with low to medium mobility levels. They enhance prosthesis control by stabilising soft tissue, reducing pistoning during gait, and are easy to handle, making them suitable for users with limited hand mobility.

### Benefits of the Distal Connection:

- Improved prosthesis control through soft tissue stabilisation
- Easy handling for users

- Various locking system options, including acoustic feedback, noiseless, and pull-in options
- User Indications:**
- Especially beneficial for those requiring soft tissue stabilisation
  - Suitable for medium and shorter limb lengths (<12cm)
  - Recommended for elderly or low to moderately active amputees

### Medical Benefits

- Increased control through soft tissue stabilisation
- High compliance, easy to use for patients with compromised hand agility



2.

## Cushion Increased support & comfort

Cushion Technology is mainly designed for transtibial users and is compatible with all shapes of residual limbs and mobility grades. It is particularly beneficial for users with short residual limbs, distinctive limb shapes, or sensitivity at the end of the limb due to its distal cushioning.

This technology is ideal for managing major volume fluctuations or knee instability and provides additional support through a sealing sleeve.

### User Indications

- Suitable for all shapes and sizes of residual limbs requiring gentle cushioning
- Recommended for all activity levels

- Ideal for transtibial amputees seeking the reassurance of a suspension sleeve
- Medical Benefits**
- Ensures good control through surface contact with the residual limb
  - Offers a comfortable user experience that supports active lifestyles





3.

### Seal-In® Great for active users

**Seal-In technology** is designed for a wide range of residual limb shapes and is particularly beneficial for active users. It is ideal for vacuum suspension without a sealing sleeve, especially for transtibial (TT) liners. The system can be used in combination with the Unity vacuum system.

#### Benefits of Seal-In Technology:

- Reduces pistoning effect in gait compared to other systems
- Provides greater rotational stability due to the sealing lip
- Enhances wearer comfort through direct socket contact, reducing the perceived weight of the prosthesis
- Offers a reduced structural height compared to distal connections with a pin

#### User Indications:

- Suitable for most residual limb shapes > 12cm with controlled volume fluctuation
- Recommended for all activity levels
- Ideal for vacuum socket users seeking sleeve-free, partial vacuum suspension

#### Medical Benefits:

- Reduced pistoning compared to other suspension methods
- Excellent rotational stability and proprioceptive control
- Comfortable user experience that supports active lifestyles

#### Variants of Seal-In Technology:

- **Seal-In X5:** Maintains a vacuum with five sealing lips, ensuring reliable suspension.
- **Seal-In X:** Features a movable sealing ring available in various profiles, allowing for individual adaptation to the user's residual limb shape and length.
- **Seal-In V:** Adapts to volume changes with its flexible sealing lip.
- **4Seal:** Utilises four sealing lips to maintain the vacuum in the socket. It comes with easy glide coating without textile cover for easy donning and doffing.
- **HSM:** Offering security and freedom through a single seal ring.

4.

### Hybrid suspension Control, comfort & security in one

A hybrid suspension system is an innovative solution that merges the advantages of both mechanical and vacuum suspension methods. This combination offers you improved control and comfort, making daily activities more manageable and enjoyable.

#### Benefits of a Hybrid Suspension System:

- Mechanical suspension securely holds the prosthesis in place with adjustable components, ensuring a stable fit.
- Vacuum suspension creates a tight seal, reducing unwanted movement within the socket for a more comfortable experience.
- The design allows for straightforward application of the prosthesis, making it easier to put on and take off.
- By integrating both systems, users benefit from a secure fit that enhances control during movement.

- With better control and comfort, you can engage confidently in your daily activities, enjoying a more active lifestyle.

#### User Indications:

- Recommended for all activity levels
- Brings the benefits of the advanced vacuum suspension of the
- Seal-In system to amputees who prefer or rely on locking suspension.

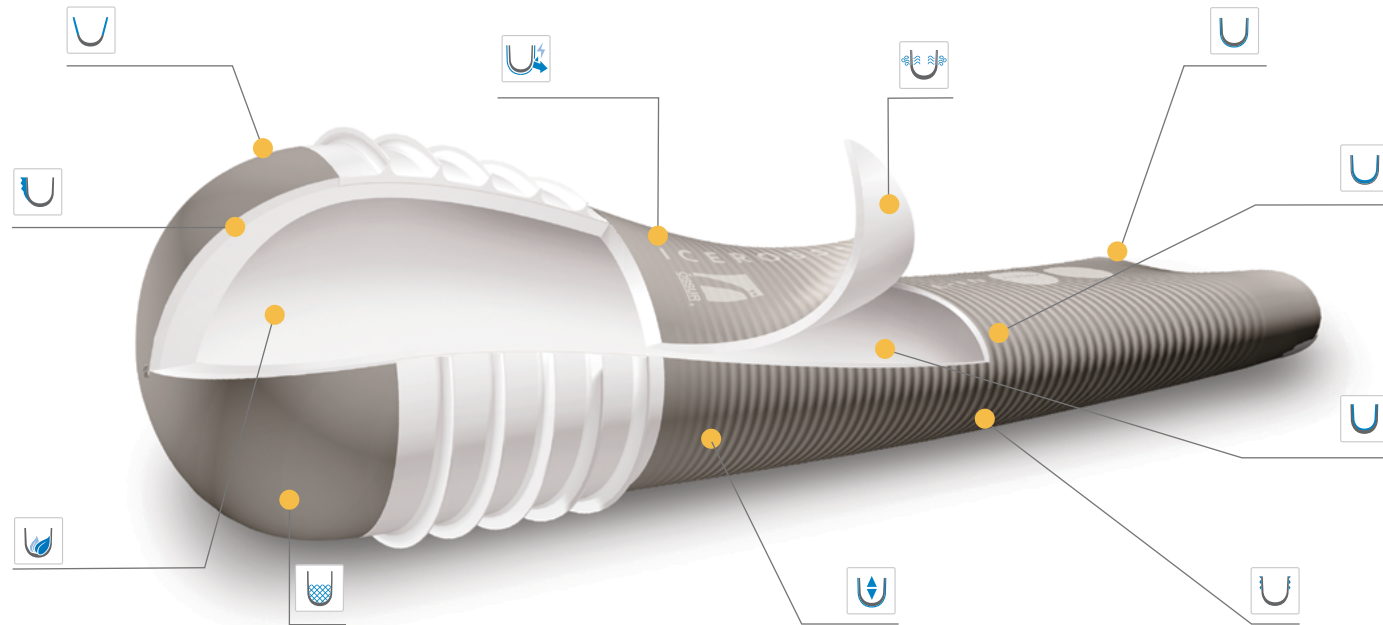
#### Medical Benefits:

- Secure suspension reduces limb movement.
- Reduced pistoning compared to other suspension methods
- Excellent rotational stability and proprioceptive control



## Characteristics of Prosthetic Liners

From silicone to gel and hybrid options, each liner type offers unique characteristics designed to support individual lifestyles.



### Conical Shape

This liner shape is intended for users with a conical residual limb.



### Tibiaguard

A soft silicone pad with a wave structure cushions the tibia\* region. The remainder of the liner consists of a thinner silicone layer. This combination of the two silicone layers with the wave function provides optimal padding and freedom of movement.

\*Tibia = shin



### Active Skin Care

Dermasil® silicone contains skin care substances such as Vaseline® and aloe vera. Vaseline prevents softening and breakdown of the skin caused by prolonged exposure to moisture (maceration) and keeps the skin from drying out. It also supports the formation of a protective layer on the surface of the skin (epidermis).



### Umbrellan

The innovative knitted fabric integrated into the liner provides protection against external electromagnetic influences. It is designed to treat phantom pain for users requiring good stability and suspension.



### Breathability

The ventilated structure of the liner reduces moisture collecting inside the liner.



### Easy Glide

Easy donning and doffing of the liner is assured by the special, gliding outer coating. Thanks to the coating's easy care properties, the liner with Easy Glide can be readily used for plaster casting, showering and bathing.



### Fabric Cover

A cover is a special textile coating on the outer surface. It is very durable and therefore suitable for extended use and extreme demands.



### Stabilising Matrix

This unique, integrated matrix allows the liner to stretch horizontally across the leg and limits the skin from stretching vertically up or down the leg, increasing the stability of the limb whilst also increasing skin comfort.



### Two-Layer Structure

Two distinct silicone layers with different shore hardnesses make up the liner. The outer layer is stronger and the inner one is softer for improved comfort and protection of the skin on the residual limb.



### Silken Inner Surface

Thanks to the silken inner surface produced using microtechnology, the liner adheres to the skin without sticking.



### Wave

The liner has a wave structure, i.e. silicone in a wave shape. This allow for comfortable stretching of the liner across the patella\* and controls folding of the liner in the sensitive area behind the knee.

\*Patella = kneecap

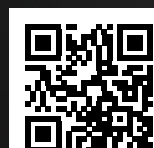
Note: Some of the illustrated features are optional and not included with every liner.

## Perfecting the Fit: Accurate Measurements and Precise Trimming

After selecting the right liner for a patient, ensuring a proper fit requires accurate measurements and careful trimming. Measurements should reflect the patient's residual limb, considering any unique features or changes in volume. Once measured, the liner needs to be trimmed to align closely with the body, avoiding areas of discomfort. To support this watch the videos that provide step-by-step guidance on measurement techniques and trimming methods, ensuring a proper and comfortable fit.



Watch video  
for guidance  
on measuring



Check here  
how to trim  
a liner





# Making the Most of a Prosthetic Liner

## Why Proper Liner Wear & Care Is Essential

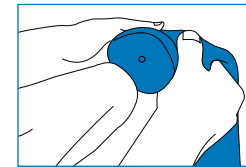
The various properties and functions of the skin are disrupted in high-stress areas by wearing a prosthesis:

In any prosthetic socket, the skin is subjected to pressure and friction. The skin's ability to regulate the temperature is affected as well. This combination of increased perspiration and stress leads to skin irritation and the growth of bacteria.

To avoid additionally stressing the skin, thorough cleaning and proper care of the skin and thus the residual limb are important. Proper cleaning, wearing and renewal of the liner comes in addition to this. To fully realise the potential of a prosthesis, the wearing and caring of skin and liner is essential!

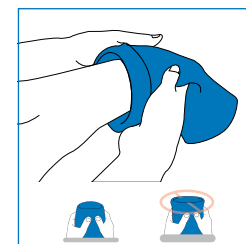
As a professional, it is important to inform your patients about these practices. By guiding them effectively, you can help ensure they achieve the full functional and health benefits of their prosthesis.

## Donning and Doffing: How to Guide a User in Donning a Liner



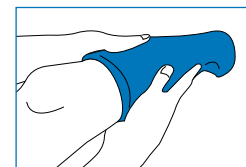
### Step 1: Prepare the Liner

- Instruct the user to turn the liner inside out, ensuring the silicone layer is facing outward.
- Show them how to hold the liner securely, referencing the illustration if provided.
- Check that the inside of the liner is clean, dry, and free of debris that could irritate the skin.
- Emphasise the importance of thoroughly cleaning the Össur liner before its first use to ensure optimal hygiene and comfort.



### Step 2: Position the Liner Cup

- Guide the user to open the liner cup as wide as possible.
- Assist them in carefully positioning the cup at the end of the residual limb, ensuring there is no air trapped between the limb and the liner cup.
- Explain that this step is essential for achieving a secure fit and preventing discomfort during wear.



### Step 3: Unroll and Don the Liner

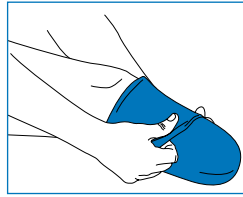
- Show the user how to unroll the Össur liner down their limb gently.
- Advise them not to use fingernails to pull or stretch the liner, as this can cause damage.
- Reinforce the need for a gradual, gentle approach to maintain the liner's integrity and ensure comfort.
- Once the liner is applied, confirm that it is properly seated without any wrinkles or gaps.
- Check that the liner aligns correctly with the residual limb, ensuring even pressure distribution.
- Encourage the user to perform a quick inspection to verify comfort and fit before moving on to other prosthetic components.
- In case of a Seal-In X liner: instruct the user to pull seal over the liner up to the desired position

Watch video  
on donning





## Donning and Doffing: How to Guide a User in Doffing a Liner



### Step 1: Prepare the Space

- Instruct the user to find a comfortable and clean area for removing the liner.
- Ensure they have everything they might need close at hand, such as cleaning supplies or a towel.

### Step 2: Loosen the Liner

- If the liner is secured with a locking mechanism or pin, guide the user on how to gently release it.
- Mention that if a donning spray was used, it could make sliding the liner off easier.

### Step 3: Roll Down the Liner

- Show the user how to unroll the Össur liner down their limb gently.
- Advise them not to use fingernails to pull or stretch the liner, as this can cause damage.
- Reinforce the need for a gradual, gentle approach to maintain the liner's integrity and ensure comfort.

### Step 4: Remove the Liner

- Once the liner is rolled down, instruct the user to gently pull it away from the residual limb.
- Remind them to be mindful of any sensitive areas that might require extra care during removal.

### Step 5: Clean the Liner

- Advise the user to clean the liner immediately after removal, following the manufacturer's instructions.
- Explain that regular cleaning helps maintain hygiene and prolongs the liner's lifespan.

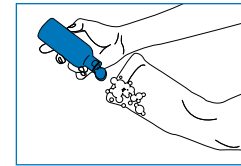
### Step 6: Inspect the Skin

- Encourage the user to take a moment to examine their residual limb for any signs of irritation, redness, or discomfort.
- Suggest they contact you if they notice any concerns.

Watch video  
on doffing

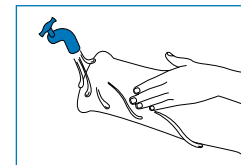


## Caring and Cleaning: What to Instruct on Wearing and Cleaning of a Liner



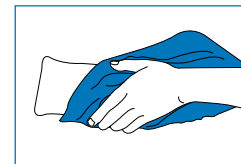
### Step 1: Remove and Wash the Liner

- Instruct the user to remove the liner and turn it inside out so the silicone layer is exposed.
- Show them how to wash the liner using warm water and a mild, pH-neutral soap.



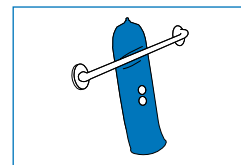
### Step 2: Rinse Thoroughly

- Emphasise the importance of rinsing the liner carefully with warm water to remove all soap residue, which can irritate the skin.
- Explain that the liner can also be machine washed at 40°C with a mild detergent if preferred, but advise against daily machine washing to avoid wearing down the fabric cover.
- Warn them never to use fabric softeners, bleach, or harsh cleaning products, as these can damage the liner.



### Step 3: Dry and Inspect the Liner

- Advise the user to dry the liner on both sides with a lint-free towel after rinsing.
- Encourage them to inspect the liner at this time, checking for any signs of damage or wear that could affect its function or cause skin problems.
- Stress the importance of addressing any damage promptly to maintain the liner's effectiveness and user comfort.



### Step 4: Prepare for Next Use

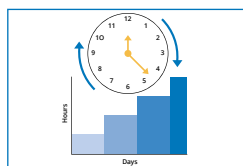
- Inform the user that the liner is ready for immediate use after cleaning; it does not need to dry overnight.
- Show them how to turn the liner back to its correct orientation with the fabric cover facing outward.
- Recommend hanging the liner to air out on a towel rack or similar surface.
- Warn against exposing the liner to foreign particles such as glass or carbon fiber, as these can cause skin irritation.
- Caution the user not to leave the liner turned inside out for long periods or expose it to extreme heat or sunlight, which can damage the material.

Watch video



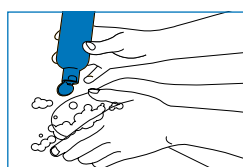


## Caring and Cleaning: What to Advise on Taking Care of the Residual Limb



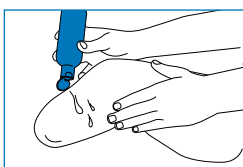
### Familiarisation

- Advise the user to allow for a familiarisation period when wearing an Össur liner for the first time or after a renewal.
- Instruct them to gradually increase the wear time by adding an hour at a time, allowing their skin to adjust to the new pressure.
- Encourage taking breaks as needed and reassure them that after the first week, the liner can be worn for longer periods as required.



### Daily Cleaning

- Emphasise the importance of daily cleaning for maintaining skin health.
- Instruct the user to wash the residual limb using a mild, pH-balanced liquid soap, such as Iceross Clean and Simple soap, which is fragrance-free and dye-free to prevent irritation.
- Reinforce that a clean liner is essential for maintaining a healthy limb and preventing skin issues.



### Hydration and Skin Care

- Advise the user to apply a moisturising lotion in the evening to nourish and soften the skin.
- Remind them to avoid applying lotion just before putting on the liner, as this can cause slippage.
- Encourage them to stay hydrated by drinking plenty of water and consider using an anti-perspirant to help manage sweating, which can prevent skin problems.

### Take Skin Problems Seriously

- Instruct the user to take immediate action if they notice any redness on the skin. Advise them to apply a rash cream in the evening and monitor for improvements.
- If a bacterial infection occurs or if the issue persists or leads to open wounds, recommend stopping the use of the liner immediately and seeking your professional consultation or a doctor's advice.
- Warn that common household products like soaps, deodorants, and perfumes can worsen skin irritation, so the user should choose products wisely to avoid further complications.

Watch video for guidance on taking care of the residual limb



## A Perfect Part of Me! - Users and their stories

A liner that fits well isn't just about comfort; it's about empowering you to live life on your terms. From pursuing passions to enjoying everyday moments, find out here about personal stories share from individuals how the right liner has helped them live fully and embrace what matters most to them.



Check here to view the stories







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