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SHEARBAN[®]

Friction Relief Technology

749 Series

PRODUCT GUIDE

Throughout this document, when you see this symbol , click on it to jump to references.





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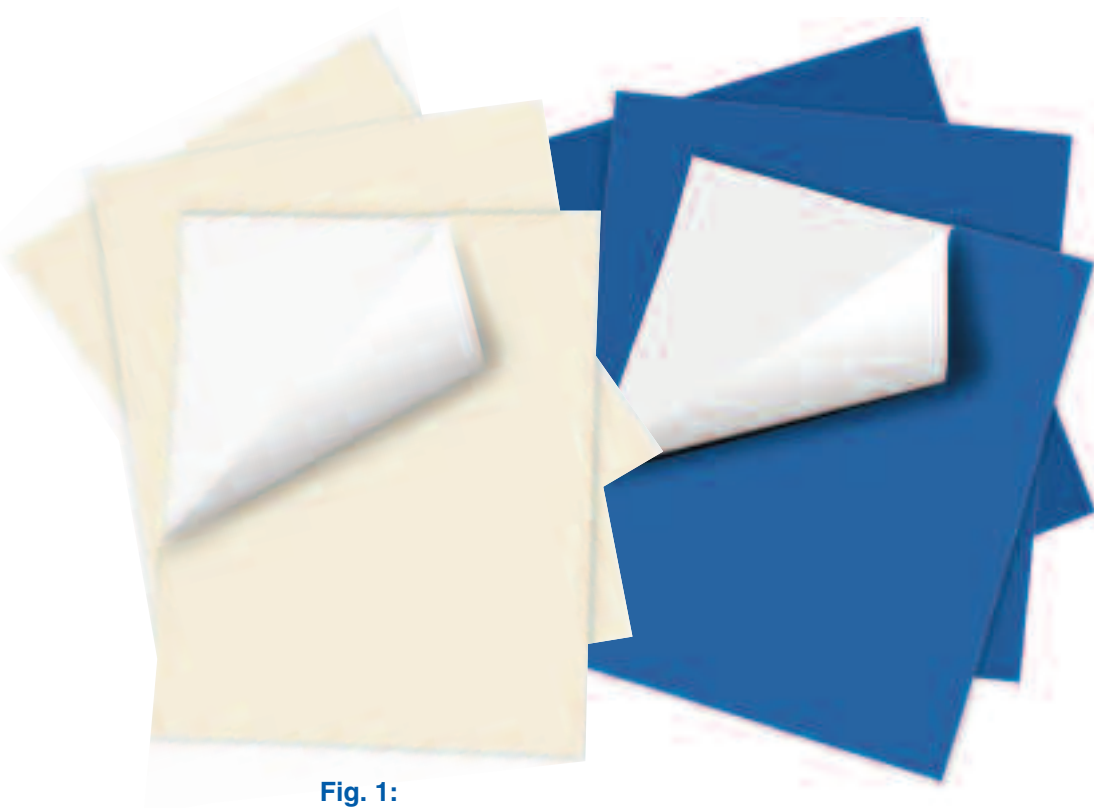


Fig. 1:
749 Series ShearBan® Sheets
(9" x12")

- Single sheet or pack of 5
- Blue or beige



Fig. 2:
ShearBan® Ovals
(1.75" X 2.75")

- Single patch or 12 pack
- Blue



I. Indications for Use

ShearBan® is useful anywhere you deal with “pressure” issues for skin integrity and comfort. Anytime you provide a close-fitting device that bears weight and/or provides orthopedic control, there is risk of damage to skin and underlying soft tissue. Using ShearBan®, it is easy to incorporate friction management in orthotic, prosthetic, and pedorthic device design by placing the patches on the device where “hot spots” or “pressure areas” are evident or probable.

Strategically use ShearBan® to:

1. Enhance patient comfort and extend periods of functional activity.
2. Provide a greater margin of safety for your patients who have some sensory (pain) deficit.
3. Maximize orthopedic support and correction beyond what is possible without strategic friction management.
4. Reduce the number of early return visits by using ShearBan® prophylactically.

ShearBan® is extremely thin and easy to use; a strong pressure sensitive adhesive (PSA) adheres the ShearBan® film wherever needed to interface between any device and the sock/skin. Due to the fact that it is applied on the device rather than on the skin, it provides a long lasting way to reduce friction and shearing forces in areas where damage to the skin and underlying soft tissue is either occurring or likely to occur (a risk area).

ShearBan reduces friction/shear forces. Padding, contouring, and off-loading reduces pressure forces. Pressure and friction/shear forces are present simultaneously, so managing both forces simultaneously (not just pressure) is most beneficial. It is ideal to reduce friction/shear forces only in specific locations.

See V. Additional Resources for links to more detailed information. 



The following identifies some examples of pedorthic, orthotic, and prosthetic and miscellaneous applications where ShearBan is useful:

Pedorthic application possibilities:

Fig. 3 - 4:

Use on insole or foot orthosis for plantar surface “hot spots” such as metatarsal heads, bases, toe tips from hammer toes or clawing, etc.

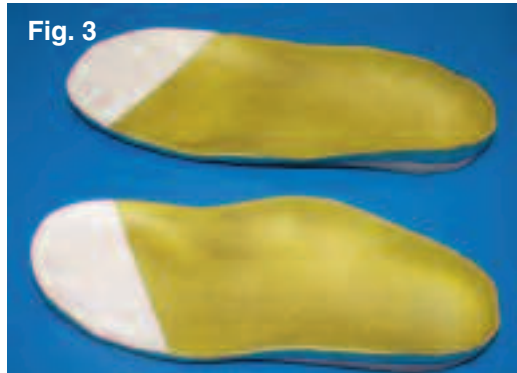


Fig. 5 - 7:

Post-ulcerations anywhere on the foot.

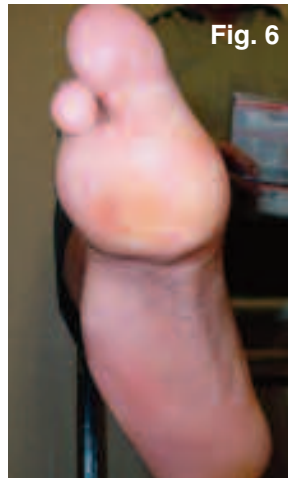


Fig. 8:

Arch area (especially when deformity is present from arthritis, Charcot, etc.).



Fig. 9:

Use on the counter of the shoe where heel/Achilles tendon rubs (tendon area, calcaneal tuberosity, Haglund’s deformity, etc.).



Fig. 10:

In the toe box area for dorsum and lateral problem areas such as hammer toes and bunions.





Orthotic application possibilities:

Fig. 11 - 12:

Any brim area where soft tissue exits the orthosis.

Areas in any lower extremity, upper extremity, or spinal orthosis where firm contact is necessary due to functional and/or corrective/alignment forces.



Prosthetic application possibilities:

Fig. 13 - 16:

Any brim area where soft tissue exits the prosthesis e.g.; popliteal area of a trans tibial prosthesis, medial/ischial brim of a TF prosthesis.

In rigid sockets (anterior distal tibia, head of the fibula, etc.)

On socket brims to protect gel liners from premature wear from rubbing.

To cover padded or unpadded ischial contact areas

Where any suspension or control strap rubs or causes irritation (not shown).



Fig. 14



Fig. 16



Miscellaneous uses:

Fig. 17 - 18:

Prevent toes from curling under when donning an AFO or shoe.

Placed along lateral edges of a post-op spinal orthosis to help it "slip on" (much easier to don, and reduces pain).

Cranial remolding helmets to reduce hair loss and dermatological concerns.

Athletic gear (footwear or protective gear where rubbing/chafing/blistering occur, etc.).

Can be used as to cover rivets or joints for improved cosmesis and to assist cleaning.





II. Fabrication Procedures

General Instructions:

- Clean the application surface (Isopropyl Alcohol will clean most surfaces).
- Size the ShearBan patch to extend beyond the area where you wish to reduce friction/shear. This will avoid edges in the high force zone.

[See III. Recommendations for Optimal Results, Sections 1-3](#) >

Techniques for Applying ShearBan

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1. Single Plane Surfaces

It is easy to apply ShearBan to surfaces which are flat or have very modest contours.

- Use a pre-cut oval or cut a piece of ShearBan that is slightly larger than the “friction area” on the skin.
- Remove backing and adhere the ShearBan to the device. Press firmly into place.



Fig. 19

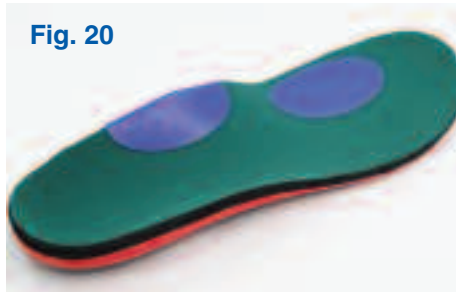


Fig. 20



Fig. 21

2. Surfaces with Complex Contours

A Spot heat technique: (Tamarack’s preferred technique)



Fig. 22

1. Apply patch first to the perimeter of relief (center will not be attached).



Fig. 23

2. Spot heat the center area of the patch with a heat gun or small torch.



Fig. 24

3. Press and rub firmly with a soft cloth until cool.



Fig. 25

4. Inlay to finish if desired. (See Technique E or F).



B Darting Technique “A”



Fig. 26

1. Gather excess material into a tight standing fold.



Fig. 27

2. Press firmly to create a crisp seam.



Fig. 28

3. Trim with sharp, small curved scissors.

4. Inlay if desired.



Fig. 29

C Darting Technique “B”

This technique is most useful when you will not be able to easily trim a standing fold with scissors (such as inside a prosthetic socket).



Fig. 30

1. Cut pie shaped darts into patch before installation. Paper patterns may be helpful. Round any corners.



Fig. 31

2. Install onto the device. (Note rounded corners.)



D Cut Strip Technique

1. Trim into 1/4" or 3/8" strips (rounding corners) and lay closely side by side.
2. Lay strips in same direction as the rubbing action. Inlay if desired.



Fig. 32

E Inlay Technique

This technique is most available to finish applications like accommodative inserts, and it produces the smoothest application result. It is important to note that the heat of the body and pressure from weight-bearing also produces “inlaying” after a short time.



Fig. 33

1. Apply patch completely using any technique.



Fig. 34

2. Heat the area of the mold where the perimeter of the Shearban will be located to the temperature recommended by the manufacturer of the foam being used. Do not heat the entire mold.



Fig. 35

3. Position the foot bed/ insole on the mold.



Fig. 36

4. Re-vacuum on the press and hold under vacuum for 10-15 minutes.



The final result shown below illustrates how this process “inlays” the patch into the foam, recessing the edges of the patch and any wrinkles or seams, for an extremely smooth application.

See III. Recommendations for Optimal Results, Sections 1-3 ➔

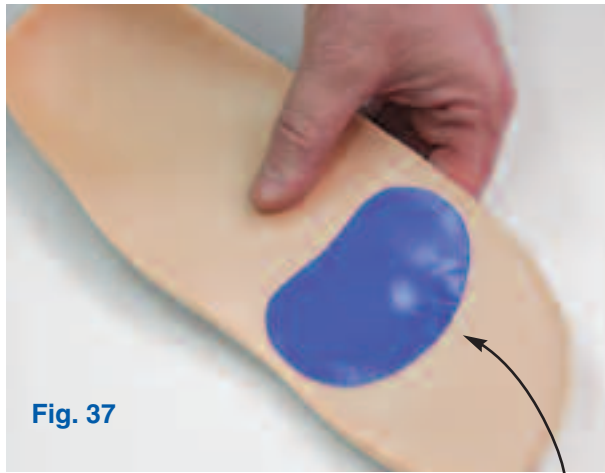


Fig. 37

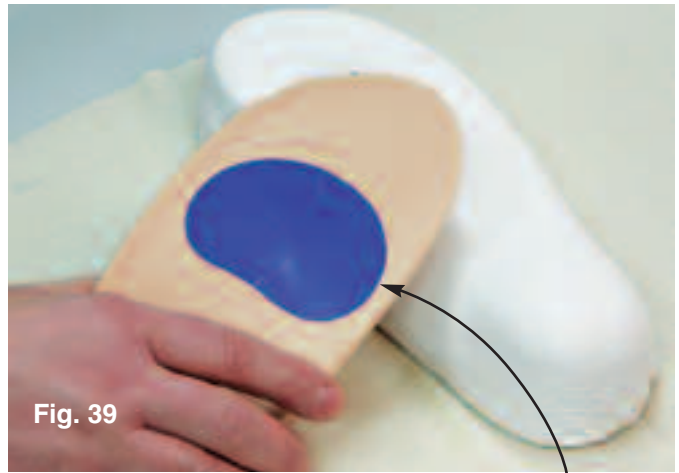


Fig. 39

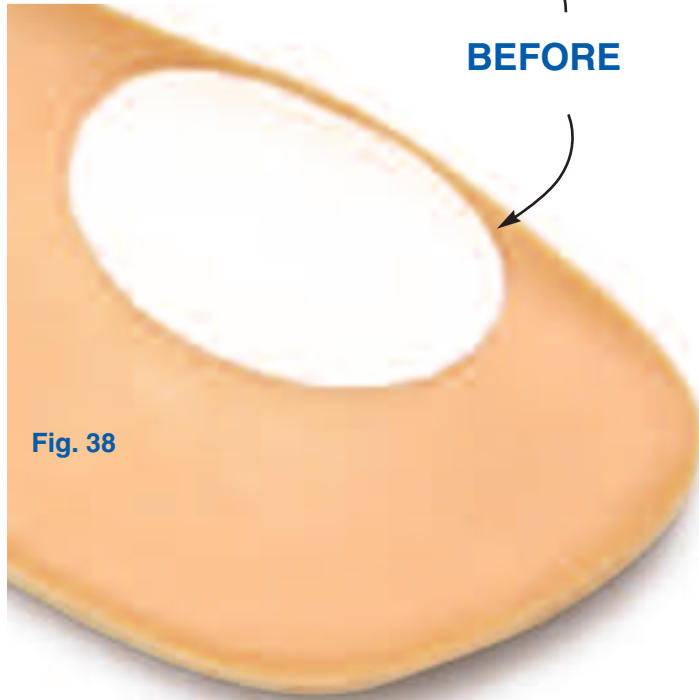


Fig. 38

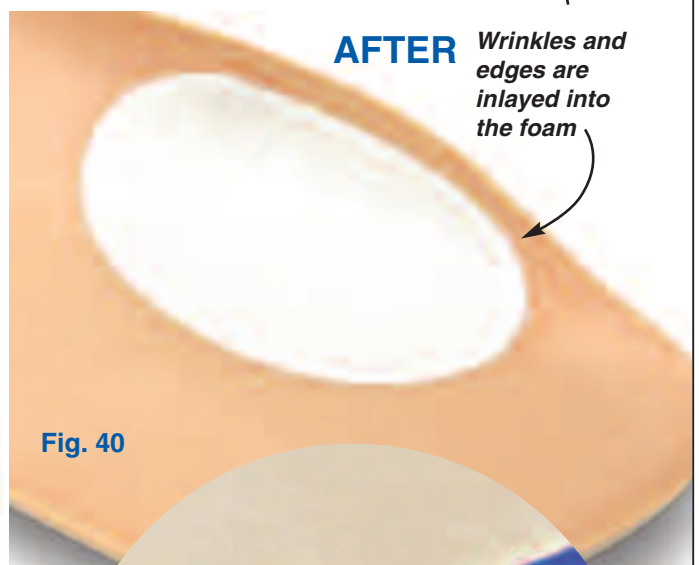


Fig. 40

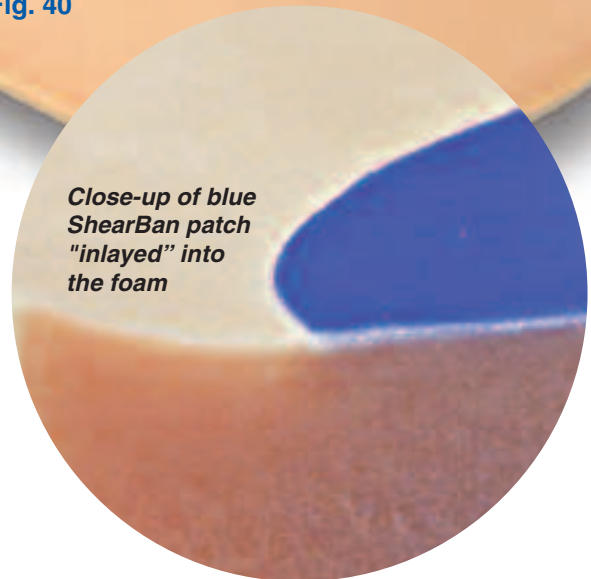


Fig. 41

If you do not have a vacuum press available when applying ShearBan, you can perform this process manually with nearly the same results if you have the mold.



F Iron-In Technique (alternative to B. Inlay Technique)

Locate or make a suitable ironing tool.

Heat up a smooth round ball or use an electrically heated device to “iron” in the edges. This technique is quite simple and works well.

Be careful not to use too hot an iron as it can delaminate the ShearBan or scorch the ShearBan and/or the foam device.

Fig. 42



Fig. 43



Fig. 44

Items shown are:

Fig. 42-44: Wheelchair Seating component (from Otto Bock: 477L52=SV002).

Mini Iron II™ “The adapter set” (from Clover: Art No.9101).

Not shown: Mini Iron™ (a more basic kit from Clover: Art No. MCI-900).



3. Brims / Edges



Fig. 45

1. Cut out ShearBan to the desired shape. Allow extra material for wrapping over the edge of the device. Install it on the inner surface first.



Fig. 46

2. Pull around tightly to keep the edge smooth. Heating the patch may help if stretching is necessary.



Fig. 47

3. Once over the edge, smooth the outside surface. If there is excessive material, collect it into a tight standing fold and trim off (*not shown in this example*).

4. Shoes

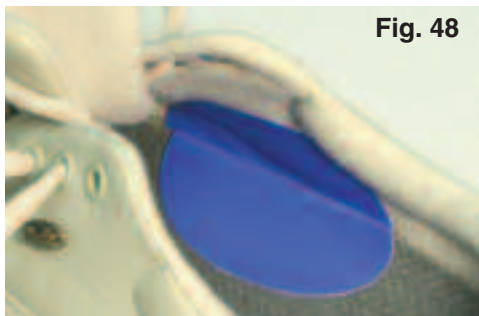


Fig. 48

Arch area: Apply to insole and wrap around medial edge. Apply a second patch to the inside of the shoe, extending below the insole.



Fig. 49

Collar area / heel counter: Apply ShearBan so it wraps over the top edge.

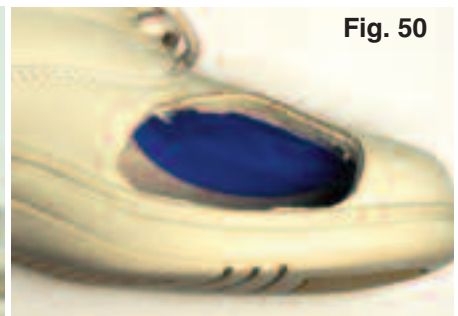


Fig. 50

Toe box area: See 5. Hard-to-Reach Locations on next page (cut out is for visual demonstration of this area).



5. Hard-to-Reach Locations



Fig. 51

1. Peel back release paper halfway and use as a handle. Avoid touching adhesive with fingers.



Fig. 52

2. Guide into position with fingers and place leading edge against device.



Fig. 53


OR Use a long tweezers to reach into the confined space – this works well for deep narrow openings, such as on prosthetic sockets (See Fig. 13 for a prosthetic socket application example ).



Fig. 54

3. Remove remaining paper backing and press the ShearBan interface firmly to adhere onto the device.



III. Recommendations for Optimal Results

1. Coverage Area.

Friction is helpful and necessary for stabilizing and controlling the device, and to minimize the loss of propulsion energy. Friction does not cause damage everywhere. Reduce friction / shear loads only in the areas where the skin is either at risk (preventative design) or in the areas where skin damage is occurring. We believe using “friction management” in this way yields the best results for orthotic, prosthetic and pedorthic applications.

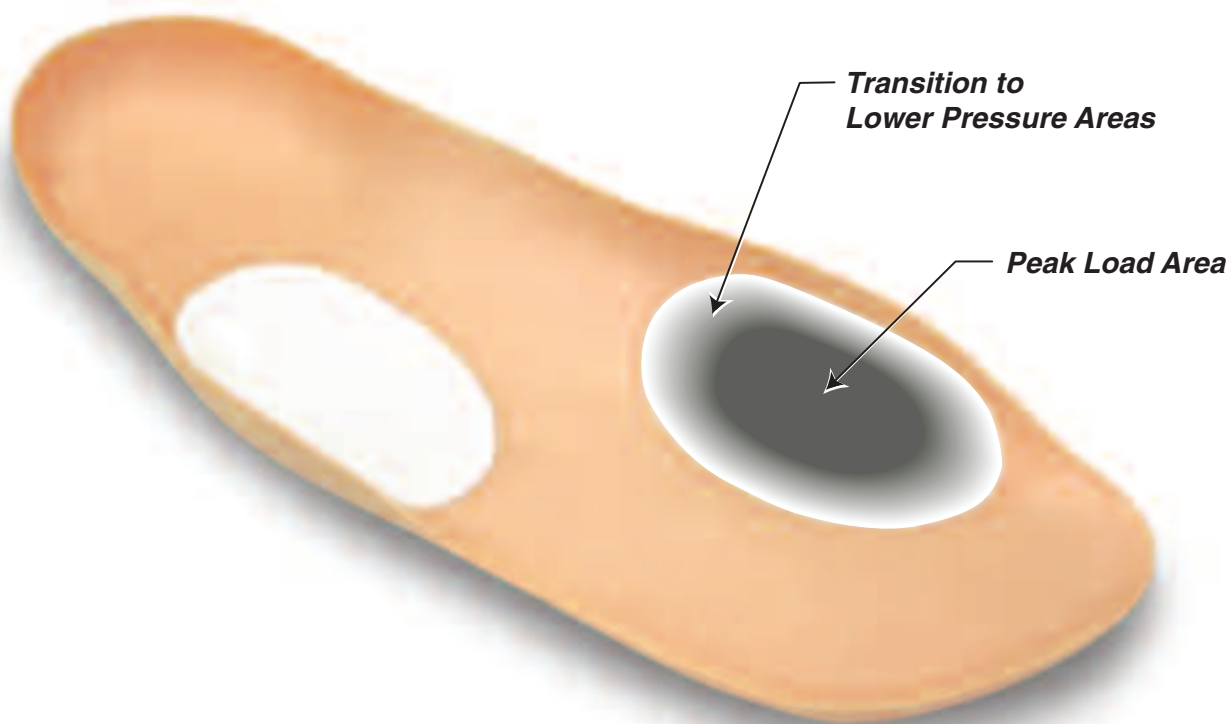
Reducing friction over an excessive portion of the contact surface area (global friction reduction) reduces the “useful friction” and may lead to problems elsewhere.

2. Edges.

Even though ShearBan is extremely thin, concern about edges is understandable in an area where high pressure forces exist.

These concerns are easily mitigated by making sure that the borders of the friction reduction interface extend beyond the area where skin damage is seen or expected. Locate the perimeter of the ShearBan interface just beyond the peak load area to provide a “transition zone” between higher and lower contact pressure areas.

Fig. 55





3. Wrinkles and Formability.

As with edge concerns, wrinkles can be concerning when high friction forces are present and it is ideal to have as smooth a surface as possible. The area contacting the wrinkle “grabs” and then transfers the forces to the skin. The low friction coefficient (CoF) of ShearBan and sock makes it more unlikely that a wrinkle will cause a problem because the contact area can’t get a “grip”.

The ability of ShearBan to conform to complex shapes is controlled by its material characteristics, as well as the severity of the contour, the contact surface material, technique used and the technical skills of the installer.

There are application site shapes where it will be necessary to form flat seams and where modest surface irregularities will be present. **High standing folds should not be allowed.** Inlaying does an excellent job of smoothing irregularities.

See Section II. Inlay Technique **E** . ➔



Fig. 56



Fig. 58



Fig. 57



Fig. 59

Finished result

4. Patch Preparation.

- Clean the application surface (Isopropyl Alcohol will clean most surfaces).
- Round any corners of the patch to prevent the corners from pulling loose.

A “scrapbooking” die with a small radius works well for cutting neat, symmetrical corners.



5. Patch Removal.

It is easy to remove patches from most materials by using a heat gun to warm the patch. This softens the PSA and allows the patch to be removed.

It is very difficult to remove a patch applied to very soft foams (e.g.; soft Aliplast™), polyurethane and cellular urethane foams (PPT®, Poron®).



Fig. 60

6. Removal of Residual Adhesive.

It is important to remove residual adhesive before applying a new patch. After removing the worn patch, use it to “blot” off any PSA remaining on the device (the PSA remaining on the patch will pull off the PSA from the device surface).

Heating the area with a heat gun before blotting is helpful.



Fig. 61



IV. Frequently Asked Questions

1. When should ShearBan be used?

We believe that the best practice includes **friction management** along with **pressure management**. It will increase your ability to provide maximum orthopedic support. As a professional orthotist, prosthetist or pedorthist, you already incorporate pressure management techniques. It makes sense to incorporate friction management as well.

2. I can use pressure mapping to identify pressure areas to identify where reliefs are needed – how do I do this with friction management?

Use the skin as the map. Excessive friction/shear loading shows up on the skin as a reddened area. You may also see chaffing and callusing. Callusing is a normal body response to friction/shear loading. If excessive callusing is left unchecked, it can lead to troublesome callus build-ups that act like pebbles or stones. These may dry out and crack open, inviting infection.

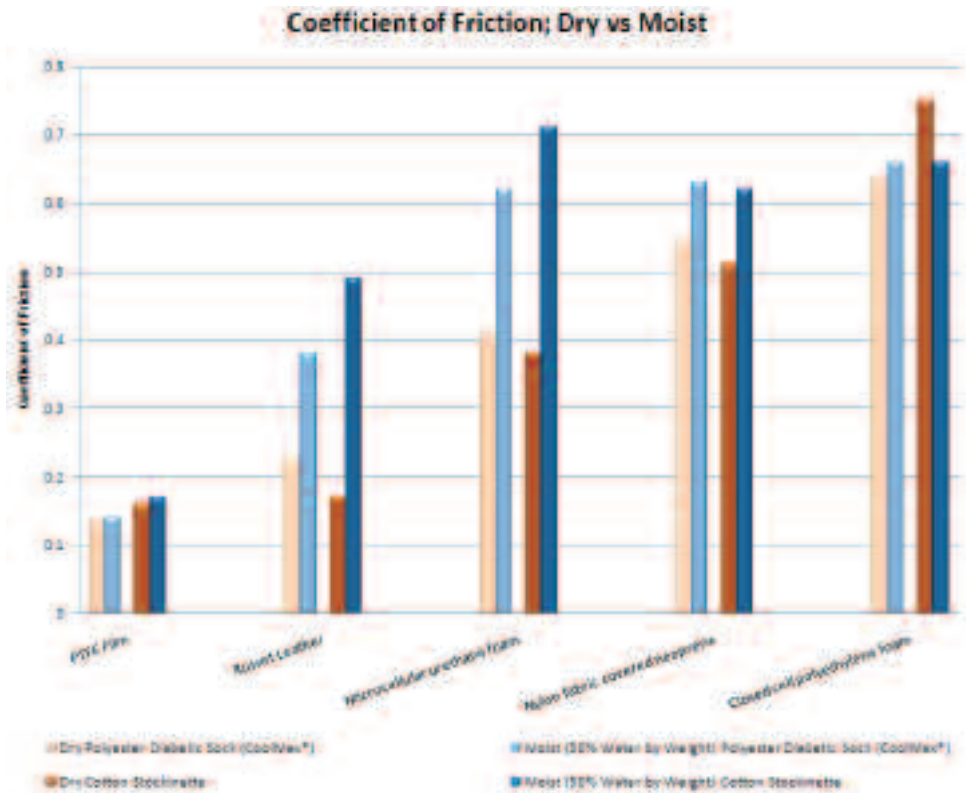
3. Does ShearBan affect pressure?

No. ShearBan is a friction management material useful for reducing the friction /shear load. It is not a pad or pressure management device. Incorporating friction management along with pressure management results in lower peak friction loads seen by the skin and subcutaneous tissues.

4. What is the Coefficient of Friction (CoF) of commonly used O&P materials?

This chart shows the static CoF for combinations in dry and moist conditions.

Fig. 62



BRAND NAME MATERIALS USED TO COLLECT THIS DATA:

PTFE film - ShearBan® ShearBan® is a registered trademark of Tamarack Habilitation Technologies, Inc.

Microcellular urethane foam - Poron® Poron® is a registered trademark of Rogers Corporation

Multi stretch nylon fabric bonded to neoprene sponge - Spenco® Insole Material Spenco® is a registered trademark of Spenco Medical Corporation

Closed cell polyethylene foam - Plastazote® Plastazote® is a registered trademark of Zotefoams, Inc.

Polyester Diabetic Sock - CoolMax® CoolMax® is a registered trademark of Invista



5. What surfaces can ShearBan be bonded to?

ShearBan can be applied onto most surfaces except silicones (it will not adhere). With fabrics, heating the PSA will help it to bond into the fabric weave or knit. Some fabrics are treated with water repellent chemicals that ShearBan doesn't bond well to. A good solution for these rare situations is to use contact cement in the area where you want to apply ShearBan.

6. Does ShearBan wear out? How long does it last?

ShearBan will wear out gradually based on the intensity of rubbing. "Claw toes" are an example of a very aggressive environment where ShearBan may only last days or weeks. In most applications, ShearBan can last months or even years. ShearBan normally matches or exceeds the life of an accommodative insert.

It is advisable to monitor ShearBan for signs of wear. Replace the patch when the white fabric base material becomes visible through the film.

7. What happens if ShearBan gets wet?

If the environment is extraordinarily wet, the patch may release from the device. If this environment cannot be avoided, contact cement can improve patch adherence.



V. Additional Resources

- **Functional Limitations From Pain caused by Repetitive Loading on the Skin:**
A Review and Discussion for Practitioners, with New Data for Limiting Friction Loads

J. Martin Carlson, CPO

JPO October 2006, Volume 18, Number 4

http://oandp.org/jpo/library/2006_04_093.asp >

- **Information available on the Tamarack website** (www.tamarackhti.com) >

Friction Management:

http://www.tamarackhti.com/friction_management/shearban.asp >

Resources:

<http://www.tamarackhti.com/resources/education.asp> >

Case Studies:

http://www.tamarackhti.com/case_studies/ >

- **Purchasing Information:**



Available in Single & Five-Sheet Packs and Pre-Cut Oval Patches		
PART #	DESCRIPTION	QUANTITY
749S-BEIGE	9"x 12" ShearBan® Sheet (beige)	1 Sheet
749S-BLUE	9"x 12" ShearBan® Sheet (blue)	1 Sheet
749-BEIGE	9"x 12" ShearBan® Sheet (beige)	5 Sheets
749-BLUE	9"x 12" ShearBan® Sheet (blue)	5 Sheets
749-OVAL	1.75"x 2.75" ShearBan® Ovals (blue)	1 Oval
749-OV12	1.75"x 2.75" ShearBan® Ovals (blue)	12 Ovals



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Tamarack™ Blog

<http://insidetamarack.wordpress.com> ➤

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