

ENGO® as a Means to Prevent and Treat Friction Blisters

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This white paper examines the scientific literature addressing the problem of friction blisters. In view of the scientific literature, this white paper explains why ENGO®, a product for preventing and treating friction blisters, offers a promising solution.

Background on ENGO®

ENGO® is a unique, patented product, developed and manufactured in Minnesota by Tamarack Habilitation Technologies, Inc. ENGO® is a patch with three layers: a low friction outer surface made of polytetrafluoroethylene (PTFE), fabric backing, and adhesive. Tamarack uses special propriety techniques to bond the PTFE to the fabric backing. The patches can be small ovals or larger rectangles that can be cut to size. ENGO® is applied to footwear or other pieces of equipment at the contact point where blisters or calluses have formed or might form – for example, the back of the heel.

Many professional and world-class athletes use ENGO®. Tamarack supplies ENGO® to athletic trainers for the U.S. Olympic Team. More than thirty professional sports teams use ENGO®. Ultra-marathoners and extreme athletes use ENGO®. The website: www.goENGO.com provides more information on ENGO® and who uses it. The website includes a long list of unpaid and unsolicited testimonials about the effectiveness of ENGO®: <http://www.goENGO.com/testimonials.aspx>.

Why Blisters Pose a Problem

People do not often see blisters as a major health problem. One group that has studied them thoroughly is the United States military. The results of military studies on blisters may surprise people.

A leading military epidemiologist who has studied blisters is Dr. Joseph Knapik. According to Dr. Knapik, friction blisters “have been a challenge to military forces throughout history.” Knapik 1995. Blisters are a major cause of military disability. At Fort Dix, more than 5% of all admissions to the General Surgical Service of Walson Army Hospital were because of friction blisters or their consequences. Akers et al. 1972. Friction blisters have a prevalence of more than 40% in new military recruits, and 16% of men and 32% of women with friction blisters receive temporary duty restrictions. Ressler 1976.

Blisters may develop into serious problems such as cellulitis or sepsis. Akers et al. 1972. Moreover, for military personnel, “limited mobility imposed by blisters may be life-threatening.” Knapik et al. 1995.

Many methods have been attempted to prevent friction blisters. The military has tested many of these. One method involves the use of an outer wool-polypropylene sock with a polyester sock liner. This sock configuration lowered foot blister incidence to 40% versus 69% in a control group. Knapik et al. 1996. But, even with use of these specialized socks, these data indicate that friction blisters remain a significant problem.

Other methods have been tried to treat friction blisters after they form. Traditional solutions such as bandages and moleskin have been found to be ineffective because they are not durable, especially on long marches. Friction blisters treated with a tissue adhesive 2-Octylcyanoacrylate did not provide statistically significant improvements and resulted in procedural discomfort. Levy et al. 2006.

Advantages of ENGO®

ENGO® offers several advantages over existing blister prevention and treatment products presently on the market (moleskin, existing on-skin dressings, socks and sock systems, insoles, lubricants, or antiperspirants). The advantages include the following:

1. ENGO® Reduces Friction Levels – the Cause of Blisters and Pain.

ENGO® attacks the cause of friction blisters, namely, friction and the shearing off of layers of skin that result from repetitive loading. Knapik et al. 1995. Naylor, Experimental Friction Blisters 1955. ENGO® creates an interface – with a sock for example – having an extremely low coefficient of friction (COF). The static COF for an interface between ENGO® and a cotton sock is 0.16 when dry or wet. Other products such as moleskin can have very high COFs when paired with common sock materials such as cotton. The interface COF of moleskin with a cotton sock, for instance, is 0.63 when dry and 0.87 when wet. Carlson JM 2006; Carlson JM 2001.

The extremely low COF of ENGO® not only prevents the repetitive friction and shear loads that cause blisters. It also can be used for blister treatment. If a hot spot or blister starts to develop, ENGO® can be applied to the inside surface of the footwear opposite the wound site. This can stop ongoing traumatization and greatly reduce pain at the blister site. Moreover, if the blister is covered with a standard adhesive bandage, ENGO® will help keep the bandage in place.

2. ENGO® Provides Targeted Protection.

ENGO® is applied to the inside surface of footwear just at the point of trauma to reduce friction in just that area. This is important. Friction is not always bad and, in fact, is necessary for efficient ambulation. Socks and insoles that reduce friction over larger areas may also reduce gait efficiency because the entire foot can slip slightly with each step. Cooper 1995. By reducing friction at a targeted location, on the other hand, ENGO® can prevent or treat friction blisters without reducing gait efficiency.

3. ENGO® is Durable.

ENGO® can typically remain in place – and effective – for several months. Dressings that apply to the skin may only last hours in demanding situations. Lubricants such as talc or spray-on films have very limited life and usually give rise to increased friction over time.

4. ENGO® is Cost-Effective.

ENGO's® small size and durability make it cost-effective. As mentioned, ENGO® is durable and can remain in place for months. On-skin bandages, powders, etc., need to be constantly re-applied. The durability of ENGO®, therefore, saves the user time and money.

5. ENGO® Is Well Tolerated by Users.

ENGO® is applied to the inside surface of footwear rather than on the skin. Skin adhesives and especially antiperspirants, Knapik 1998, can irritate the skin. On-skin adhesive dressings can damage

sensitive skin when removed from the body. ENGO® does not pose these risks. Moreover, ENGO® is latex-free.

Conclusion

Blisters are not just an inconvenience. For many runners, hikers, walkers, travelers, and even wearers of high-heels, they can be debilitating. At the very least they compromise performance or comfort. At worst, they are dangerous. ENGO® offers so many advantages over other blister prevention and care products: ENGO® reduces the cause of blisters, friction; ENGO® provides targeted friction relief; ENGO® is durable, cost-effective, and well-tolerated by users. When the scientific literature is examined and weighed, ENGO® offers a sound solution.

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