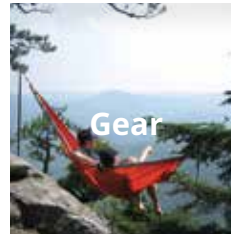




insect  shield[®]
repellent technology

Education Guide

Insect Shield technology converts clothing and gear into long-lasting, effective and convenient insect protection.



Gear



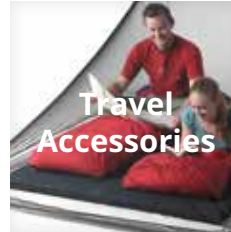
Global Health



Outdoor Lifestyle



Equestrian



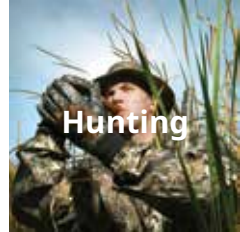
Travel Accessories



Military



Travel



Hunting



Pet



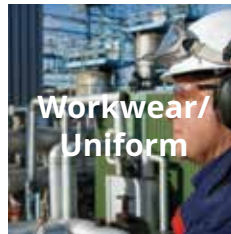
Gardening



Apparel Accessories



Fishing



Workwear/Uniform

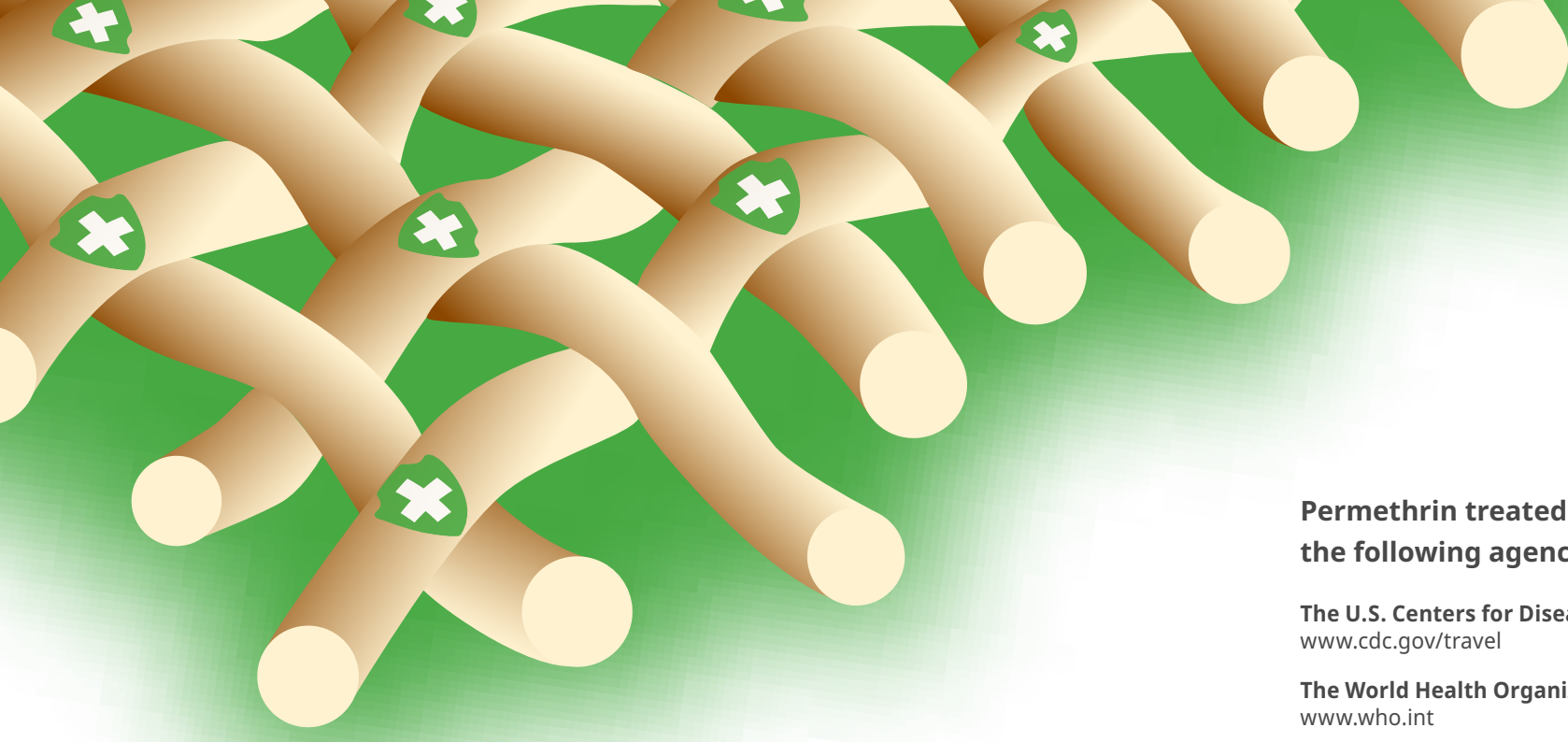


Youth



Maternity

Photo credits:
· Global Health: World Vision
· Travel Accessories: Sea to Summit
· Equestrian: Weatherbeeta



The active ingredient in Insect Shield, permethrin, is so tightly bonded to the fabric fibers that it retains effective repellency through the expected life of the product.

Permethrin treated apparel is recommended by the following agencies:

The U.S. Centers for Disease Control and Prevention (CDC):
www.cdc.gov/travel

The World Health Organization (WHO):
www.who.int

National Institute for Occupational Health and Safety:
www.cdc.gov/niosh/topics/lyme

The American Academy of Family Physicians:
www.familydoctor.org

The Public Health Agency of Canada:
www.phac-aspc.gc.ca



Mosquitoes

Insect Shield technology repels insects including those that can carry Zika virus, Lyme disease, West Nile virus, malaria and other insect-borne diseases. You can't tell it's there, but the bugs can.



Flies



Midges



Ticks



Fleas



Ants



Chiggers

Insect Shield® Advantages

- **Effective**

Repels mosquitoes, ticks, ants, biting flies, chiggers, and midges (no-see-ums).

- **Does not require re-application**

- **Cannot be swallowed**

- **No potential for over-use**

- **Not harmful to eyes**

- **Can be used by everyone**

Insect Shield can be used by the entire family with no restrictions for use. Technology can be used by women who are pregnant or nursing. Can be used by infants and children of any age.

- **Easy Care**

Normal home laundering is recommended. Do not dry clean.



Insect Shield received the most favorable rating given by the EPA.



The U.S. Environmental Protection Agency (EPA) issues a consumer labeling category rating for each product registered. Insect Shield has been rated a category IV by the EPA, which is the most favorable rating.

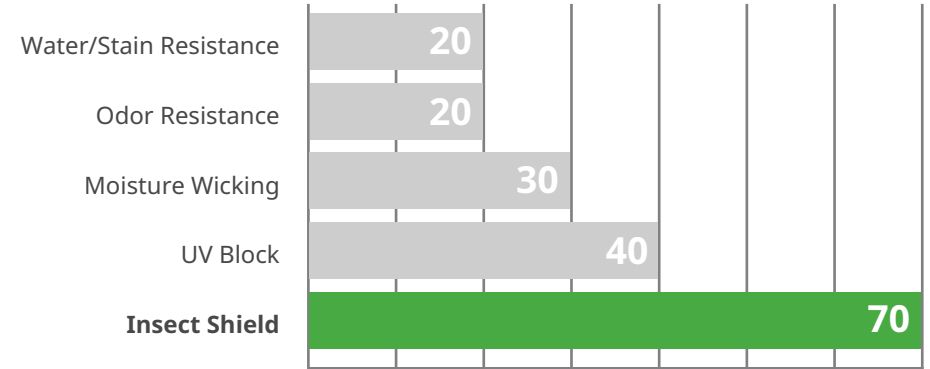
Category I DANGER	Category II WARNING	Category III CAUTION	Category IV NONE REQUIRED
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The overall category is determined by the most severe route of exposure (i.e., oral, dermal, ocular, inhalation).

Bleach	Insect Repellent Clothing and Gear Spray, 0.5% Permethrin
Liquid Disinfectant Bowl Cleaner	Disinfectant Daily Shower Cleaner
Disinfectant Antibacterial Kitchen Cleaner	Insect Repellent for Kids, 7% DEET
Insect Repellent, 15% DEET	Insect Shield® Repellent Apparel



Insect Shield repellent apparel lasts through 70 launderings, the expected lifetime of a garment.



Examples of technical finish durabilities

Insect Shield Shelf Life

Since the EPA registration was achieved in 2003, ongoing shelf life studies are being conducted. To date there has been no degradation in Insect Shield repellency.

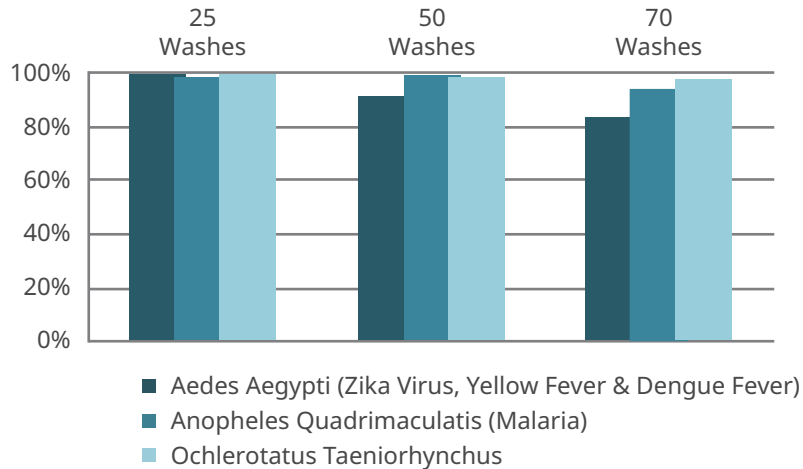
Insect Shield is tested and proven.

Knockdown Testing Overview

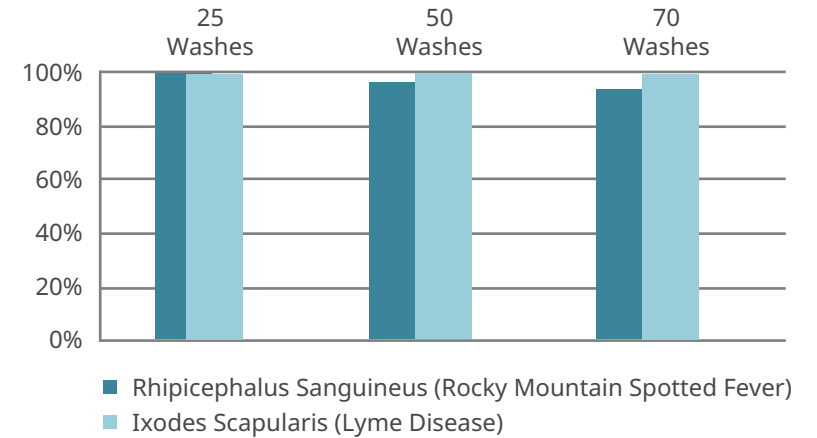
Knockdown testing is a widely accepted scientific methodology for determining efficacy of insect-repellent treated textile products. Knockdown is a precise lab test that shows effectiveness through long-term washings.



Insect Shield Average Knockdown Effectiveness on Mosquitoes



Insect Shield Average Knockdown Effectiveness on Ticks



The Insect Shield process is designed to prevent loss of active ingredient outside the system. This is very different from other fabric treatments that require wastewater management.





Pilot Study Assessing Effectiveness of Long-lasting Permethrin-Impregnated Clothing for the Prevention of Tick Bites

Authors: Meagan Vaughn and Steven Meshnick, University of North Carolina at Chapel Hill, Department of Epidemiology

Employees from the Wetlands and Permitting Unit of the (NCDWQ) were chosen for a study due to the high level of work-related tick bites.

Results: Group wearing Insect Shield had 99% fewer tick attachments during working hours than the control group using normal insect control methods and untreated clothing.

Report was published online in the Journal of Vector-Borne and Zoonotic Diseases.

Insect Shield is an approved vendor of the US Army and US Marine Corps.

The US Army treats all combat uniforms issued to soldiers with permethrin insect protection.

Research shows that permethrin-treated clothing that tested at 66% knockdown in the laboratory achieved 97% bite reduction in the field.

US Army/ USDA Research Study Results

Published in the American Journal of Tropical Medicine & Hygiene

Title: The Effectiveness of Permethrin For Protection Against Aedes Taeniorhynchus.
(Schreck, Haile & Kline).

This field study is considered to be one of the most comprehensive conducted on permethrin-treated textiles.





Insect Shield supports global health.

Insect Shield welcomes opportunities to assist agencies and international relief organizations that work to protect at-risk populations from insect-borne diseases.

For the latest Insect Shield global health initiatives be sure to visit www.insectshield.com and click on “Global Health”

Every year, millions of people around the world are affected by insect-borne diseases. Insect Shield is proud to work with International relief organizations on uniform and blanket programs.

Additional Insect Shield FAQs

What is the origin of Permethrin?

Permethrin, the active ingredient in Insect Shield technology, has been used in the United States as an EPA-registered product since 1979, with an excellent safety record. Permethrin is in the pyrethroid family. Pyrethroids are synthetic copies of natural extracts found in plants such as the chrysanthemum flower.

What else is Permethrin used for?

Agriculture and Lice Prevention
Permethrin is used in a number of ways to control insects. The uses are far ranging and include lice

shampoos for children, flea dips for dogs, agriculture and various other products, some of which are regulated by the FDA.

Mosquito Nets

According to the Centers for Disease Control and Prevention (CDC) only pyrethroid insecticides are approved for use on insecticide-treated nets. In community-wide trials in several African countries, treated nets have been shown to reduce deaths of children under 5 years from all causes by about 20%. The World Health Organization (WHO) recommends that pyrethroid treated nets be distributed to and used by all people (universal coverage) in malarious areas, not just by the most vulnerable groups: pregnant women and children under 5 years.

What are the benefits of wearing permethrin-treated clothing?

When the bugs start biting, we are all conditioned to using traditional topical repellents. Insect repellent sprays and lotions are usually our first line of defense when battling the bugs. However, permethrin-treated clothing has proven as effective as topical repellents such as DEET and offers a number of added benefits for the entire family.

- Insect Shield protection remains bonded to the clothing and does not have to be applied (and reapplied) directly to the skin.
- The more Insect Shield worn or used, the greater the protection. So Insect Shield apparel and gear can reduce the need for skin-applied repellents.

How much protection can Insect Shield provide?

A small item of Insect Shield clothing provides less repellency than a larger one. You may need to adjust the

amount of Insect Shield apparel you wear, depending on the number of biting insects that are present. For example, you might prefer to wear pants instead of shorts in certain situations; long sleeves instead of short; or add a hat and socks. Topical repellent can be used for exposed skin, and is especially recommended for heavily infested locations.

What does EPA registration mean?

Insect Shield is registered by the Environmental Protection Agency (EPA). The EPA registration process is designed to evaluate a proposed product to ensure it is effective and will not have adverse effects on people or the environment. Insect Shield products have been rigorously evaluated on multiple levels: the chemistry, the application process and the final consumer product.

Will Insect Shield Repellency come off when I sweat?

No. Insect Shield repellency is so tightly bonded to the fabric fibers that the apparel repellency retains effectiveness through 70 washings, the expected lifetime of the garment.

Will Insect Shield cause skin irritations?

Numerous 3rd party studies have been conducted to assess possible skin irritations with use of Insect Shield products. Since 2003, Insect Shield has treated millions of apparel and gear products and has only had a few mild recorded cases – all from individuals with strong existing allergies to various plants.

Can Insect Shield products be used around cats?

Insect Shield technology is used in a wide assortment of pet products including beds, blankets, cots, gaiters, bandanas and apparel items. While

permethrin has been known to be harmful to cats in liquid form, Insect Shield repellency is so tightly bound to the fabric fibers in such minimal amounts that it can be used in multi-pet household environments.

Is Insect Shield harmful to fish?

Permethrin in liquid form is known to be harmful to fish. However, Insect Shield products do not pose risks to fish since the permethrin is bound so tightly to the fabric, preventing leaching into the environment.

Which insects does Insect Shield repel?

Insect Shield® Repellent Apparel has been proven and registered to repel mosquitoes, ticks, ants, biting flies, chiggers, and midges (no-see-ums). Insect Shield® Repellent Gear has been proven and registered to repel mosquitoes, ticks, fleas, and biting flies. The EPA requires extensive effectiveness data to prove a

product's ability to repel insects. Many species and varieties of these insects have been tested, including many that can carry dangerous diseases.

How long will Insect Shield protection last?

The repellency of Insect Shield apparel is EPA-registered to last through 70 launderings — the expected lifetime of a garment. This is also well beyond the life of most performance fabric finishes commonly used in the technical-apparel industry. Insect Shield gear repellency remains effective through 25 launderings for washable items.

What are the benefits of Insect Shield vs. other forms of insect protection?

Insect Shield apparel puts insect repellency near your skin, instead of on it, and the protection is invisible. Also, the repellency is long lasting so no re-application is needed, which

is convenient, and can help alleviate concerns about overuse and misuse of repellent.

How do you care for Insect Shield products?

For items that can be washed, normal home laundering is recommended. Insect Shield repellent apparel can be bleached, starched, pressed, etc., without adverse effect on the repellent quality; however, it should not be dry-cleaned.

Why can't the products be dry-cleaned?

Dry cleaning removes some of the active ingredient — which reduces the insect-repellent quality of the apparel.



Insect Shield, LLC

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