

insect
shield®

 **HORSE
ARMOR**®
knockdowngear



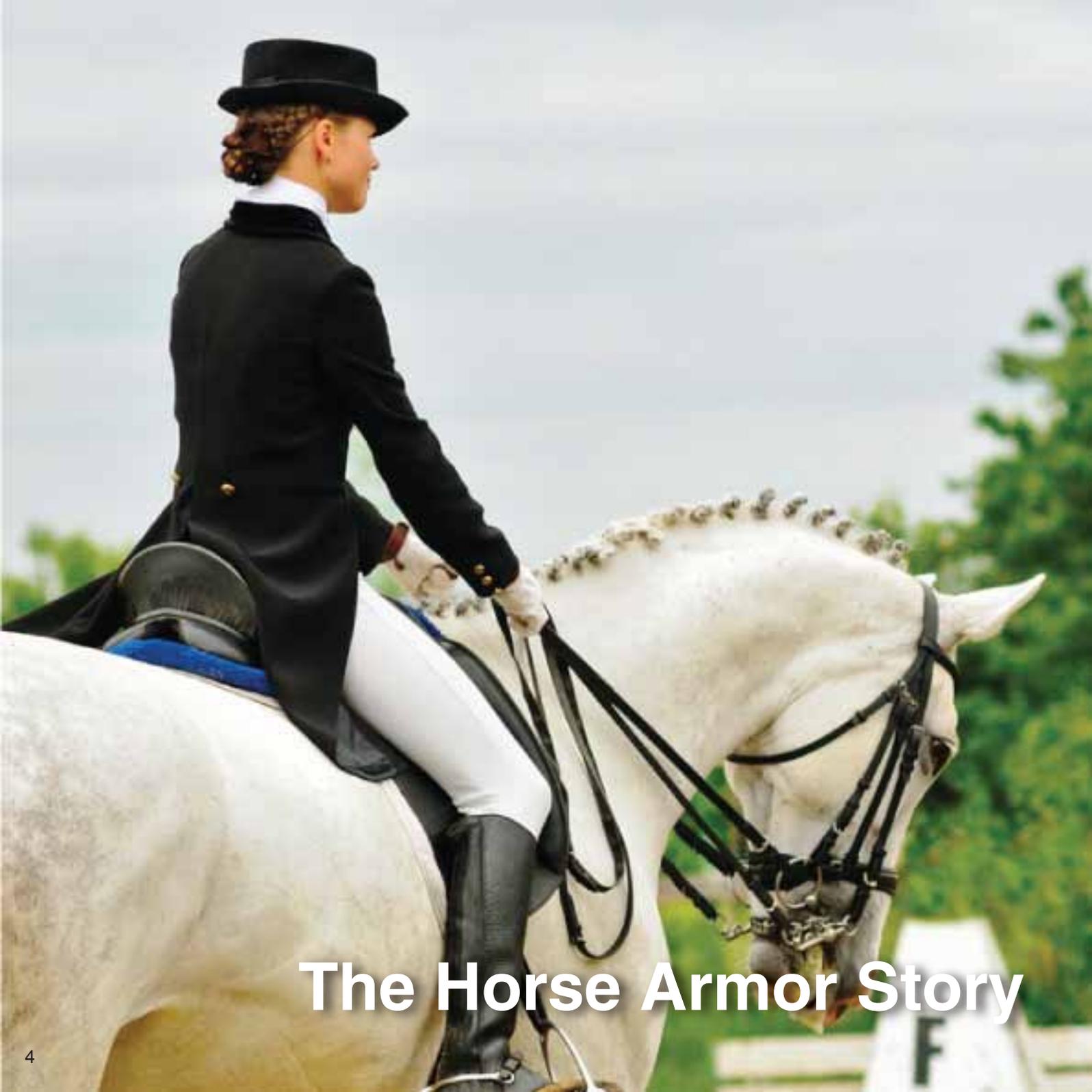
Equine Anti-Insect Gear
Season 2015



Armored

Contents

Introduction	5
Insect Pests of Horses	7
Anti-insect Technology	9
Knockdown Trials	10
Optimum Protective Color	11
Knockdown sheet	13
Knockdown wraps	15
Knockdown mask	16
Size Matters	18
Horse Armor Science	19
FAQs	20



The Horse Armor Story

Introduction

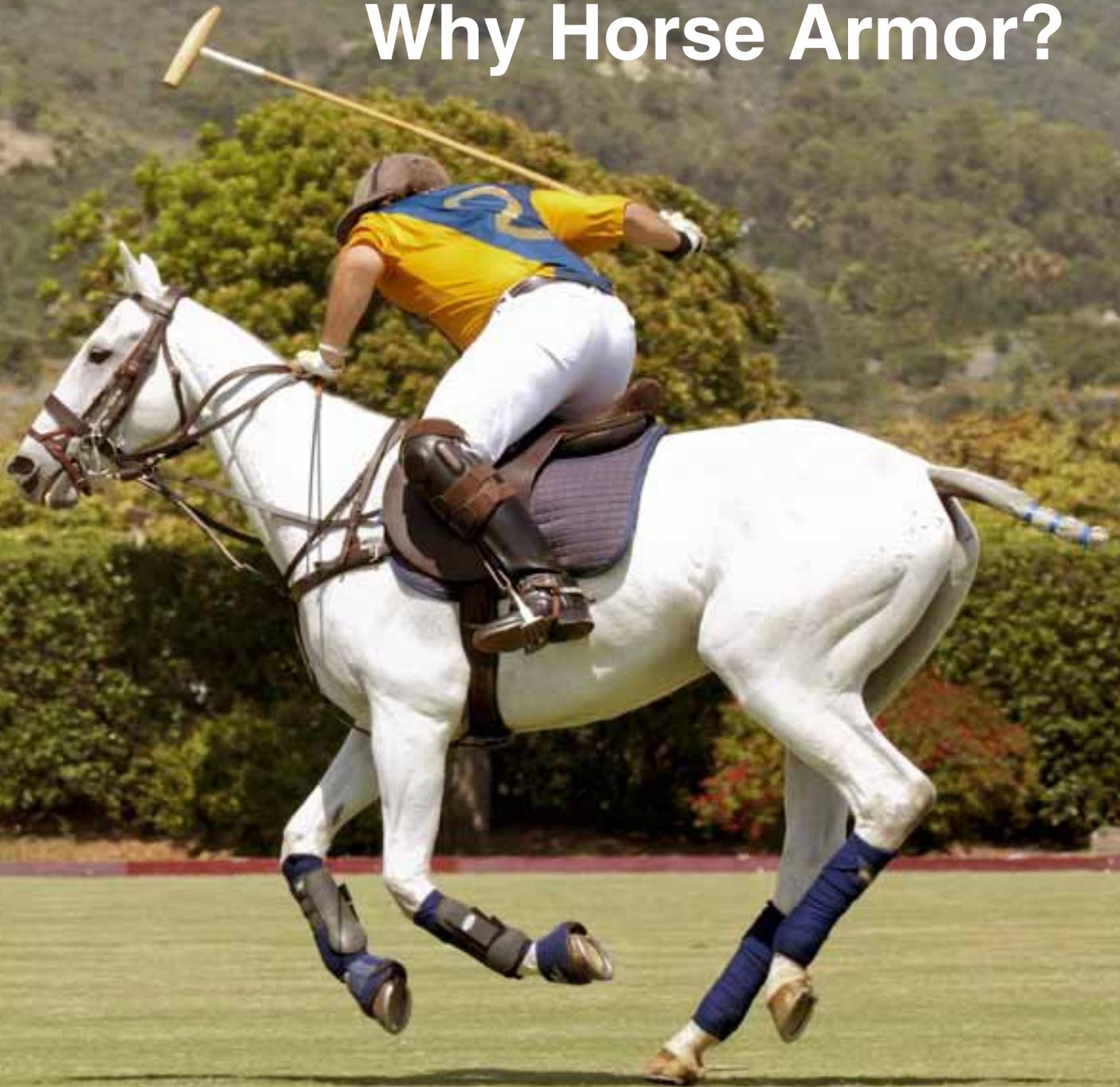
There is actually a helluva a story behind the invention of Horse Armor which involves some extraordinary drive and pretty impressive science.

Back to the beginning. The inspiration behind Horse Armor was provided by a Dutchman who used his love for animals, background in equestrian sports and animal science degree with his experience of producing WHO (World Health Organization) approved Long Lasting Insecticidal Mosquito Nets (LLINs) for malaria prevention to develop an effective solution for battling insect pests of horses.

Which wasn't easy. It actually took him several years (including consultations with University professors and other brains) to work it out. His starting point was that if Long Lasting Insecticidal Mosquito Nets provide humans with a safe and long lasting protection against insect bites, the same concept may be applicable to horse fly sheets. By impregnating horse fly sheets with an insecticidal substance and bind that substance in such a way that it is firmly attached to the fabric, horses wearing such fly sheet will be protected against a great variety of insects and this fly sheet will be effective for months and months without the need of re-applying the insecticide.

Once he had established that Horse Armor was really safe for horses, that it effectively knocked down insects, that the effect was long lasting and as a result that horses were well protected from being bitten or stung by harmful insect he didn't waste any time. He set up a production chain and started sending Horse Armor Knockdown sheets around the planet so that horse owners all over the world would be able to provide their horses the necessary protection against harmful flying and crawling insects.

Why Horse Armor?



Insect Pests of Horses

A great number of insect pests can cause irritation and damage to horses. These pests include flying insects such as biting flies, nuisance flies and mosquitoes as well as crawling insects such as lice, mites and ticks. Symptoms of these pests vary from minor itching and irritation to blood loss, extreme annoyance, fatigue and malnutrition. The most common insect pests associated with horses and their premises are listed below:

1 FLIES	Premise	Pasture
Nuisance flies	House flies	Face flies, Bot flies
Biting flies	Stable flies	Horse & Deer flies, Horn flies, Black flies, Sand flies

2 MOSQUITOES

3 CRAWLING INSECTS

Lice, ticks, mites



In case you wish to know more about the insect pests of horses go to: www.horsearmor.net



Horse Armor Technologies

Anti-insect Technology

Permethrin

The insecticide that is used in Horse Armor is permethrin. Permethrin belongs to the family of pyrethroids which are synthetic compounds similar to the natural pyrethrins produced by Chrysanthemums and daisies. Permethrin is unique as it can serve both as an insecticide, killing insects on contact, and as an insect repellent. It is an odorless neurotoxin that is used in agriculture and veterinary work and as the primary prescribed treatment for humans with lice or scabies. In numerous studies permethrin has been found to kill a wide variety of insects and it is described as the most effective clothing impregnate available. Horse Armor is using the technology of Insect Shield for the impregnation of Horse Armor Knockdown sheets.



Insect Shield

The Insect Shield® technology is a revolutionary insecticidal compound designed to provide long-lasting, effective and convenient personal insect protection. The durable protection provided by Insect Shield is the result of years of research and testing. In July 2003, Insect Shield was registered by the United States Environmental Protection Agency. In 2006, the United States Environmental Protection Agency (EPA) accepted an amendment extending the durability claims from 25 washes to 70 washes. The duration of its insecticidal and repelling activity is supported by experimental data. Insect Shield combines the patent-pending Insect Shield process with a proprietary formulation of the insect repellent permethrin resulting in effective, odorless insect protection that lasts the expected lifetime of the impregnated fabrics.

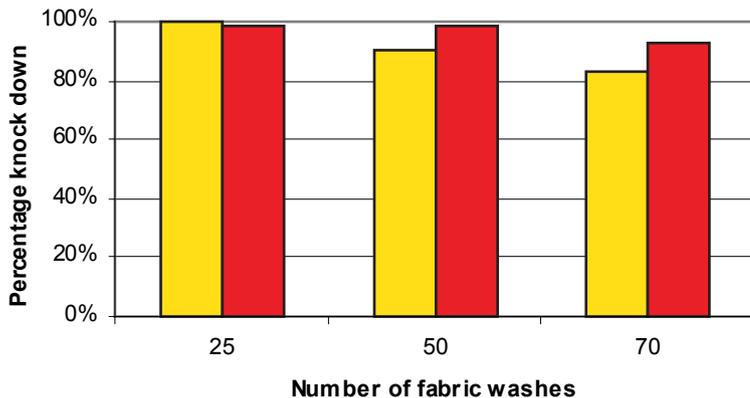
insect  shield®

Knockdown Trials

The efficacy of the Insect Shield permethrin-polymer coating used by Horse Armor is assessed by knockdown testing. Knockdown (KD) testing is a widely accepted scientific laboratory methodology for determining the efficacy of insect repellent-treated textile products.

A Knockdown trial is the only test to show effectiveness through long-term washings using a scientific method. Many recognized agencies utilize KD testing for this purpose, including the World Health Organization (WHO). One of the advantages of KD testing is that no animal subjects are exposed to insects. For the KD test, a permethrin impregnated textile sample is placed in an enclosed space containing insects for a specified time period, after which the sample is removed and the effect on the insects is documented and knockdown rates are recorded. The test results below illustrate the superior effectiveness of the Insect Shield permethrin-polymer technology on 2 different species of mosquitoes.

**Average knockdown efficacy of
Insect Shield® coated fabrics on mosquitos**



- Yellow fever mosquito (*Aedes aegypti*) transmits yellow fever & dengue fever (in humans)
- Malaria mosquito (*Anopheles quadrimaculatis*) transmits malaria (in humans)

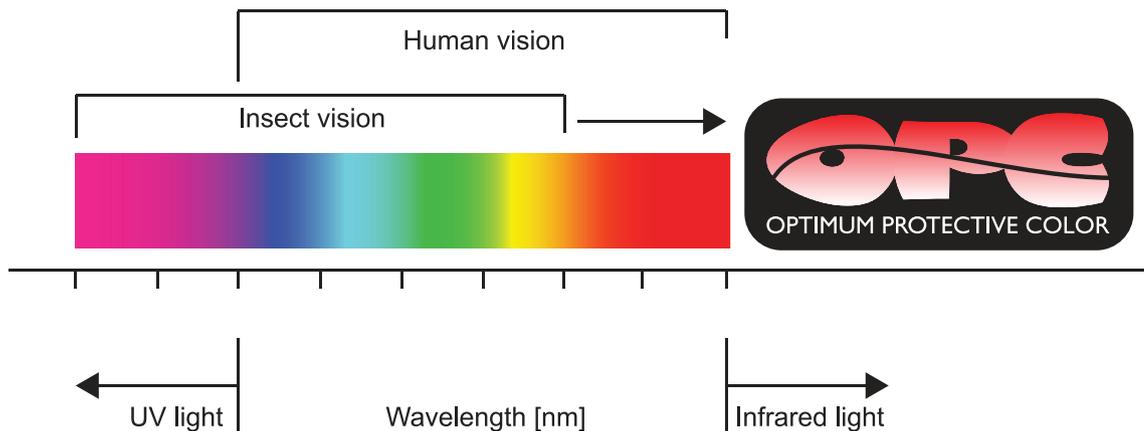


Optimum Protective Color

The visible light spectrum for humans is made up of seven different colors: red, orange, yellow, green, blue, indigo, and violet, in length from 400 to 700 billionths of a meter in length.

Insects see things different to humans. The human eyes distinguish colors in only a small part of the solar spectrum that we call visible. We distinguish colors because our vision is trichromatic. Different animals perceive colors differently due to variations in spectral sensitivity. Most insects also have trichromatic vision like us but with color sensitivities shifted to the ultraviolet range. They are attracted to blue and ultraviolet wavelengths because they are shorter with a higher frequency while red wavelengths are longer and have a lower frequency. The latter is much harder for the insects to detect. So the spectrum of colors visible to insects is a little higher in frequency than what we humans can see.

In short, light becomes visible to insects around the ultraviolet part of the color spectrum and ends at yellow light and that's why many insects do not see red. Horse Armor has selected an Optimum Protective Color in the red spectrum for its Knockdown sheets and leg wraps which makes the gear virtually invisible to insects. This is why Horse Armor Knockdown gear is an even more effective barrier preventing insects from biting horses.



Completely Insect Free



knockdown sheet

The Horse Armor Knockdown sheet with removable neck piece is a lightweight and comfortable fly sheet made of Optimum Protective Color polyester mesh fabric containing an Insect Shield® coating that knocks down and kills flies, mosquitoes, ticks and other insects. The active substance that is used on the Horse Armor Knockdown sheet is permethrin. Permethrin is a nature-identical synthetic substance widely used as an anti-insect compound and insect repellent. The Insect Shield® impregnation of Horse Armor Knockdown sheets is invisible, odorless, long-lasting and safe for horses and humans.

Key features

- Long-lasting Insect Shield® coating that knocks down insects and lasts up to 70 launderings
- Cooling warp knitted mesh with superior durability
- Removable neck piece
- Optimum protective color red to reduce visibility for insects
- Lightweight sideways release buckles for easy on/off
- Anatomically cut to ensure comfort fit
- Elastic adjustable and removable leg straps

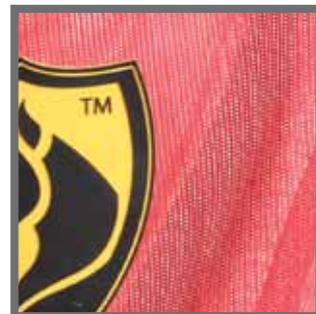


Long Lasting Efficacy

The active substance in Insect Shield® is applied to the Horse Armor Knockdown sheets along with a binding substance that makes the insecticide actually available to repel and knock down insects at the same time. It will not be absorbed by the fibers and therefore it will remain effective as long as the average useful life of the Knockdown sheet. That means it is withstanding sweating of the horse as well as a large number of up to 70 washings without being washed out.

Cooling Durable Warp Knitted Mesh

The mesh fabric of the Horse Armor Knockdown sheets is warp knitted using multiple fine quality 600D polyester yarns to give superior durability. The fabric serves as a physical barrier between the horse's skin and insects and as a substrate for the permethrin. It also keeps the horse cool by allowing body heat out and cool air in. The durability, toughness, and tear-resistance of warp knitted polyester make fly sheets suitable for wearing as a turnout blanket or in the stable.



Light Weight Side-Release Buckles

All Horse Armor Knockdown sheets are fitted with lightweight side-release buckles. The buckles are made of thermoplastic polymer resins and feature a center support rib for crush resistance and large finger wells that allow easy access and low release force.



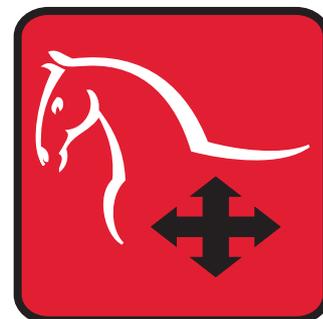
Elastic adjustable and removable leg straps

High quality adjustable and removable leg straps will keep the Horse Armor Knockdown sheet snugly secure, especially if criss-cross strapped. The sliders and snaps on the straps have smooth edges so your horse will not feel any discomfort wearing them. And, when the straps get dirty they can be removed easily for cleaning.



Comfort Fit

Size matters a lot to us here at Horse Armor. We naturally understand and design fly sheets for a horse's body, Horse Armor Knockdown sheets are cut in such a way that they are not too tight and not too loose. Of course, getting the right fly sheet size is very important for wearing comfort. Horse Armor Knockdown sheets have a unique size chart so make sure you use our size guide to determine the ultimate size.



knockdown wraps

The Horse Armor Knockdown wraps are lightweight and comfortable leg wraps made of Optimum Protective Color polyester mesh fabric containing an Insect Shield® coating that knocks down and kills flies, mosquitoes, ticks and other insects. The active substance that is used on the Horse Armor Knockdown wraps is permethrin. Permethrin is a nature-identical synthetic substance widely used as anti-insect compound and insect repellent. The Insect Shield® impregnation of Horse Armor Knockdown wraps is invisible, odorless, long-lasting (up to 70 washes) and safe for horses and humans. The Knockdown wraps effectively minimize stomping associated with the horses attempt to fight off flies.

Key features

- Long-lasting Insect Shield® coating that knocks down insects and lasts up to 70 launderings
- Cooling warp knitted mesh with superior durability
- Optimum protective color red to reduce visibility for insects
- 5 cm (2") wide velcro straps for easy on / off
- Reinforcement with vertical stays to prevent sliding down
- Fleece trim for improved comfort



Comfort Fit

The Horse Armor Knockdown wraps with long-lasting anti-insect properties are designed for optimum wearing comfort. They are made of soft cooling durable warp knitted mesh. On the front side they are reinforced with vertical stays to prevent sliding down while the fleece trim prevents shafting. The Knockdown wraps are easy to put on and off using the three 5 cm wide velcro straps.



knockdownmask

The Horse Armor Knockdown mask is a lightweight and comfortable fly mask made of Optimum Protective Color polyester mesh fabric containing an Insect Shield® coating that knocks down and kills flies, mosquitoes, ticks and other insects. The active substance that is used on the Horse Armor Knockdown masks is permethrin. Permethrin is a nature-identical synthetic substance widely used as anti-insect compound and insect repellent. The Insect Shield® impregnation of Horse Armor Knockdown masks is invisible, odorless, long-lasting (up to 70 washes) and safe for horses and humans.

Key features

- Long-lasting Insect Shield® coating that knocks down insects and lasts up to 70 launderings
- Cooling warp knitted mesh with superior durability
- Stiff pliable mesh for the eye spheres to prevent eye contact
- Soft mesh for the ears to maximize tolerance in case of sensitive ears
- Optimum protective color red to reduce visibility for insects
- 5 cm (2") wide velcro strap for easy on / off with additional buckle for safety



Comfort Fit

The Horse Armor Knockdown mask with long-lasting anti-insect properties is designed for optimum wearing comfort. It is made of soft cooling durable warp knitted mesh. Softer mesh is used for the ears to maximize tolerance in case the horse has sensitive ears. The Knockdown mask is easy to put on and off using a 5 cm wide velcro strap, while an additional strap with side-release buckle ensures that the mask stays on.





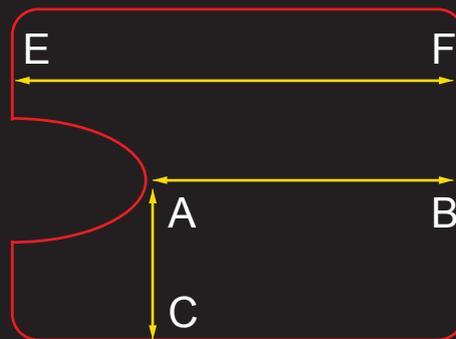
Ultimate Comfort Fit

Size Matters

Getting the right fly sheet size is very important for wearing comfort. A well-fitted sheet should not rub a horse's withers or shoulders as he moves or grazes, instead it should rest comfortably along his chest, shoulders and back.

Horse Armor Knockdown sheet sizes correspond to the horse's side measurements and are sized by cm or inches, starting at 145 cm or 4'9" and going up to 213 cm or 7'0". Below 5-step measuring process helps determining the desired Horse Armor Knockdown sheet size.

- ① Using a flexible measuring tape measure the distance from the center of the chest.
- ② Around the widest part of the shoulder and the widest part of the hind quarter.
- ③ To the edge of the tail.
- ④ The measurement result is the blanket size.
- ⑤ If the measurement does not respond to a blanket size, round up to the next higher number



Horse size category	Extra Small		Small		Medium		Large		Extra Large		
Withers height (A-D) (cm)	105 - 110	110 - 120	121 - 130	131 - 140	141 - 150	151 - 160	161 - 170	171 - 175	176 - 180	181 & more	
Fly Sheet Size Chart Unit: cm											
Fly Sheet Size		XS	SS	S	SM	M	ML	L	LL	XL	XLL
	ft	4'9"	5'0"	5'3"	5'6"	5'9"	6'0"	6'3"	6'6"	6'9"	7'0"
	cm	145	152	160	168	175	183	191	198	206	213
Withers to tail (cm)	A - B	95	105	110	115	125	135	140	145	155	160
Rug drop from withers (cm)	A - C	75	79	85	88	88	88	91	91	91	110
Chest to tail (cm)	E - F	145	152	160	168	175	183	191	198	206	213

In case you wish to know more about size measurement go to: www.horsearmor.net

Horse Armor Science

We are backed by solid proof. Here's where we lay down in black and white the scientific proven reason why Insect Shield® impregnated Horse Armor Knockdown sheets in the Optimum Protection Color are safe and effectively protect your horse against insect pests.

So far, numerous studies have been carried out to assess the use of permethrin for insect protection of horses which have been published in independent scientific journals. Also numerous research has been published identifying the visible light spectrum of insects.

What have they proven? They have shown that:

- Permethrin-impregnated net blankets significantly reduce stable-fly populations.
- Laboratory tests in a fly chamber and field trials have shown that permethrin will effectively control biting flies.
- Permethrin provides good control against the stable fly and the sand fly *Culicoides* spp on horses.
- Permethrin is one of the safest pesticides for humans and most other mammals.
- Light becomes visible to insects around the ultraviolet part of the color spectrum and ends at yellow light and therefore many insects do not see red.



*In case you wish to know more about the studies and the scientists behind them go to:
www.horsearmor.net*

FAQs

What is an Insect Shield impregnated Horse Armor Knockdown sheet and how does it work?

The concept of a long-lasting Insect Shield impregnated fly sheet is a mesh sheet on which the insecticide effect lasts as long as the average useful life of that sheet even when it is washed and exposed to perspiration regularly. The insecticide that is used on the Horse Armor Knockdown Sheet is permethrin. Permethrin is a nature-identical synthetic chemical widely used as an insecticide and insect repellent. In low doses it is not known to rapidly harm humans or horses and is poorly absorbed by the skin. The permethrin impregnation of Horse Armor fly sheets is invisible, odorless, long-lasting (up to 70 washes) and safe.

Why is an Insect Shield impregnated Horse Armor Knockdown sheet so different?

Insecticide impregnated Horse Armor Knockdown sheets are different because their unique combination of features works better than any single component and their benefits are backed by scientific research. The Knockdown sheet's mesh offers physical protection against biting insects and because of the long-lasting Insect Shield impregnation it also repels and knocks down insects attempting to bite the horse. Horse Armor Knockdown sheet features include:

- Insect Shield impregnated
- Long lasting efficacy
- Cooling durable warp knitted mesh
- Optimum Protective Color
- Comfort fit

Is there any proof that an Insect Shield impregnated Horse Armor Knockdown sheet will help my horse?

Research results show that the insecticide permethrin as a pour-on concentrate, whole body spray treatment as well as impregnated on a blanket is effective for insect control on horses. With Horse Armor, permethrin is applied to the polyester mesh sheet along with a polymer binding substance that makes the insecticide available to repel and knock down insects. It will not be absorbed by the mesh sheet fibers and is bound by a binder. Therefore it will remain effective for a long period, thereby withstanding sweating of the horse as well as a large number of washings (70) without being

washed out. Consequently it's not necessary to re-apply the insecticide as is the case with pour-on concentrates or body sprays.

Why are Horse Armor Knockdown sheets only available in the Optimum Protective Color?

Light becomes visible to insects around the ultraviolet part of the color spectrum and ends at yellow light and that's why many insects do not see red. Horse Armor has selected an Optimum Protective Color in the red spectrum for its fly sheets which makes the sheets virtually invisible to insects. This is why the insecticide impregnated and non-impregnated Horse Armor Knockdown sheets are even more effective barriers preventing insects from biting horses.

Is the Insect Shield impregnated Horse Armor Knockdown sheet safe for my horse?

The insecticide that is used on the Horse Armor Knockdown Sheet is permethrin. Although toxic to insects, permethrin is one of the safest pesticides for humans and most other mammals. Permethrin does not present a notable genotoxicity or immunotoxicity in farm animals and permethrin may even be used for topical application on horses. Despite its safety, sensitivity to permethrin may occur after using it on humans and animals. Occasionally horses may react adversely when contact with permethrin occurs. The signs are itching and swollen skin and those signs usually disappear within a few days of stopping treatment. If signs of sensitivity occur, bathe your horse with a mild, non-insecticidal shampoo, and rinse with large amounts of water. Talk with your veterinarian if signs continue.

Why should I choose Insect Shield impregnated Horse Armor Knockdown sheets over less expensive horse fly sheets?

Because no-one's knows more about insecticide treated garments than Horse Armor. Horse Armor's unique Knockdown sheet has been developed over years of testing. Horse Armor was able to develop a unique combination of features that work better than any single component and their benefits and the benefits are backed by scientific research.



**HORSE
ARMOR**[®]

www.horsearmor.net