Skintex® MR III
KNOCKDEAD/KNOCKDOWN INSECTS

Skintex® MR III
MRIII
The Most Efficient KD Insect Protection in Textiles

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Pulcra Chemicals
The solution specialist
Skintex® MR III
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• The only EPA registered microencapsulated technology system based on Permethrin

• EPA Registration #86110-2
• Patent pending technology
• KD nuisance and disease carrying mosquitoes, ticks, ants, flies, chiggers and midge effect for insects when they land and/or feed
• “HOTFOOT” scenario for insects when they land
• Durable to washing
• Colorless, odorless, non-greasy textile application
• MR III has all the advantages listed by the WHO and exceeds traditional textile treatments in performance

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• KD Nuisance, Disease Carrying Insects and more…

• MRIII treated gear and apparel € EPA Registration #86110-2
• MRIII treated items provide a long lasting KD vector tool
• Millions of permethrin filled microcapsules are bound to the fabric
  – Loading level of permethrin is 1.25 g/m²
• Permethrin filled microcapsules provide a slow release mechanism
  – Microcapsules release permethrin when the item is in use
• Microcapsules reduces the level of exposure to both garment cutter and end-user
• Microcapsules are on average 10 times smaller than the mosquito proboscis
• KD Nuisance, Disease Carrying Insects and more…

• Continuous manufacturing process evenly and intimately distributes permethrin microcapsules across the fabric width
• Encapsulation of the permethrin reduces UV degradation
• Biogents independent laboratory testing proven efficacy
• Launderings without efficacy loss
• Skintex MRIII has proven to be very effective at killing disease carrying insects in Independent Clinical Lab testing that follow WHO test methods along with Military and Institutional field trials
• No sensitizing potential detected in HRIPT/human repeated insult patch test
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• EPA approved MRIII treated items
  • Apparel (includes but not limited to shirts, pants, jackets, hats, socks)
  • Sleeping bag covers
  • Backpacks
  • Outdoor furniture covers
  • Outdoor furniture cushion covers
  • Netting
  • Ground cloths
  • Horse blankets
  • Pet bedding
  • Tents
  • Tarps
  • Awnings
  • Patio umbrella covers
  • Kennel covers

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Skintex® MRIII Blanket

Can be produced in many colors (minimums apply).
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Dimensional relations
Skintex MR III microcapsules on Anopheles Stephensi

Permethrin Microcapsules

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Skintex MRIII microcapsules on proboscis of Aedes Aegypti

Permethrin Microcapsules

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Dimensional relations

Proboscis of mosquito through polyamide knitwear treated with Skintex® MR III

Skintex® MR III microcapsules attached to fibers

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Biogents Chamber Cage Test
- Worst case test using a human volunteer
- 30 mosquitoes per test
- 2 minute duration
Fig. 1: (A) Test cage (front view). The air ventilation system is connected to the cage (black arrow). The textiles are exposed at the test window in the metal floor sheet (white cross). (B) Test cage battery.
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Biogents 2 minute chamber/cage test procedure:
• Forearm of the test person is tightly covered with the MRIII test fabric
• Forearm is held to the open window/floor area of the cage
• Open area presents a defined surface mosquitoes area to land/feed
• Mosquitoes landing #'s on the test surface are counted
• Mosquitoes probing #'s and/or biting the arm are recorded

<table>
<thead>
<tr>
<th>Sample</th>
<th># of Landings</th>
<th># of Bites</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skintex MRIII</td>
<td>46</td>
<td>0</td>
<td>Mosquitoes have:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- difficulties piercing test fabric</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- reduced landings after 100 seconds</td>
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WHO Tube Test

**Fig. 1:** Standard WHO Tubes. The textile sample is inserted into the plastic tube. The transfer tube is not shown (see the Appendix section for further information).

**Fig. 2:** Plastic Cup. Through the whole at the bottom mosquitoes are transferred into the cup.

One hour after the exposure the number of knocked down mosquitoes is counted. The percent mortality (rate of dead animals) is determined after 24 hours:

\[
\text{% Mortality} = 100 \times \frac{\text{Number of dead or knocked-down test mosquitoes}}{\text{Total number of test mosquitoes}}
\]
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• Biogents Independent Clinical Lab results
• Exposure time = 3 min
• WHO considers 95% knockdown or 80% mortality a passing result
**WHO washing**: As per WHO guideline with 2 g/l Marseiller soap in 500 ml deionized water, pH 10-11, 10 min 30°C, 2 x 10 min rinsing. Piece of 25 x 25 cm in 1000 ml beaker, shaking at 155 movements per minute.
Thank you for your attention

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