

Nanotech Water-Repellent Breathable Fabric Treatments

The U.S. Army Natick Research, Development, and Engineering Center published research in 2008 on water-repellent fabric treatments based on nanotechnology approaches. Soldiers' duty and combat uniforms can be made water-resistant and retain the same air permeability and comfort properties as the untreated wicking fabric. Following a separate field trial using combat uniforms with and without a DWR treatment, it was found that these treatments decreased the comfort of the uniform in hot and humid environments. It is likely that the non-wicking behavior of the fabric was responsible for perceived comfort differences, per comments from the field trial, and by subsequent coupled physiological/fabric modeling. This is consistent with previous studies that have examined the effect of water repellent treatments on cotton fabrics.

*Treatment (2)
Moderate Water Repellent on Outer Face,
Good Wicking Finish on Inner Face*



Backlit Outer Face
(difficult to see drop)



Normal Lighting, Outer Face
(yellow indicates wet area on inside)
(drop rolled slightly to right)

Wet fabric on inside doesn't affect repellency on outside.

Reference/Publication

"Water-Repellent Treatment on Military Uniform Fabrics: Physiological and Comfort Implications," *Journal of Industrial Textiles* **38** (1), pp. 43-54, 2008.

Contributing Agency: DoD / RDECOM