

Several years ago I was given the following article about water proof breathable fabrics. The writer was an employee of the Marathon Rubber Products Co. Marathon produces rainwear apparel as well as other rubberized products and is located in Wausau, Wisconsin. It is obvious that the motivation for this article was the introduction of Goretex to the rainwear market, although the Goretex name never appears in the article.

"Breathable" fabrics, in our opinion, have several serious deficiencies - so serious, in fact, that we could never recommend these overpriced fabrics for any sportsman needing truly waterproof and windproof protective clothing.

#1 - A basic law of physics states that heated air has a greater affinity or holding capacity for moisture or humidity. Since your body temperature inside clothing heats up when you are active, air temperature inside next to the skin can often rise easily above 100 degrees F. Rarely when it rains, if ever, is the temperature outside 100 degrees F. Therefore, if anything, a "breathable" fabric will actually allow more moisture to gather inside the rain garment! The exact opposite of what is claimed.

#2 - No pressure buildup is possible inside a rain garment, therefore, there is no reason for moisture laden air to pass through any kind of barrier, much less a microporous one. Think about the screen door - with holes that big there is still no movement of air through the door unless there is a breeze or some pressure built up by fans, etc. A rain garment will ventilate through the neck opening, sleeve openings, and around the waist, and even through the front zipper or snaps first. . . not allowing pressure to build.

#3 - Water surface tension, or film that holds rain drops together, or that you see creeping up the inside of a water glass will easily bridge or cover the micropores of any breathable fabric. Blocking up the pores won't allow any air to pass, therefore, the breathable fabric becomes clogged in the rain just when you need it.

#4 - Fabric itself absorbs perspiration, not the breathable coating. Fabric provides an extra insulating barrier to reduce condensation inside a garment. The same effect can be achieved by wearing a long sleeve shirt...much less expensively too.

#5 - One product in particular has been advertised to the sporting goods industry as breathable, yet it is also advertised to a different market as a joint sealant impervious to liquids and gases. Marathon sells to both sporting goods as well as heavy industrial markets, and so we discovered this "unusual" marketing technique. Which story is correct?

#6 - Wind chill/hypothermia concerns are obvious with a "breathable" fabric as wind would produce enough driving force to penetrate the rain garment and chill you inside through evaporation.

While the article, I believe, is extremely enlightening, the writer has made a minor error. He refers to fabrics as breathable, but it would be more accurate to have stated "vapor permeable".

Item #1 refers to heated air retaining moisture. That is correct. If you were on the north slope of Alaska, you would discover that arctic air is so dry there is no moisture in the air.

Item #2 explains that the moist air developed by the body will not escape through the microscopic holes of the film laminated to the shell fabric if there are larger openings for it to move through.

Item #3 I especially like. When the U.S. Army field tested the Goretex with temperatures below 0 degrees F they found that frost built up on the inside of the rain garments. The moist vapor was condensing and then freezing, never having gotten out of the garment. In warmer conditions the moisture will only condense and bead up on the interior of the garment, never escaping.

Item #6 is also not quite right. If your skin surface is wet due to the lack of vapor permeability of the garment you are wearing and you are faced with excessive wind, the pressure of the clothing being pushed against your skin surface will give you a chill very quickly. This is because the moist vapor your body was producing couldn't evaporate and was trapped against your skin surface as well as in your clothing. Depending on the circumstances it would lead to a hypothermic situation.

As always, you are welcome to call me at 1-800-748-1827 if you have any questions.



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