The Future Uses of Conductive Thread by Ewan Fisher

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Conductive thread is part of the E-textiles line, a relatively recent area of electronics that has been gaining momentum with appearances on the catwalk as well as in military applications. E-textiles are defined as any textile that can have digital, electronic or computer technology embedded in them. Perhaps the most immediately obvious are LEDs woven into a fashion item, such as the thread in a t-shirt or belt; but there are literally hundreds of active applications featuring conductive thread, many of which have heavy industrial or armed forces capabilities.

Colloquially known as smart clothing, fabric and wearable items that actively incorporate technology might sound like something out of a cyberpunk novel but they are already active in some specialty areas. Wetsuits featuring heated threads, for example, have been trialled for both sporting and military applications, enabling the wearer to move more freely in even Arctic temperature seas. In this case the conductive thread technology delivers perfectly, warming the core and limbs of the surfer or Navy SEAL â€“ the only problem lies in finding a power source that does not act as a potential attractor to sharks.

There are some forms of conductive thread that are able to stiffen when a current is passed through them â€“ allowing future body armour, in potential at least, to be light and wearable rather than cumbersome and hot. It is important to note that most genuine military applications (i.e. ones in real testing as opposed to theoretically possible military uses of conductive thread) are shrouded in so much secrecy that one can only speculate as to their end use or stage of development.

In general terms, e-textiles fall into two categories â€“ the classic and the modern. Classic e-textiles are really normal garments with electronic devices wired into them â€“ as is the case with the LED belt alluded to above. The textile part of the garment is still a basic textile, as anyone would recognise it â€“ but it has either had wiring woven into it, or sewn onto it (if you have ever seen the movie Tron you will know what I mean: the glowing wires on the suits are not part of the suits, but sewn onto them).

Modern e-textiles use genuine conductive thread â€“ textile components that are real thread, in a defined sense, but which have conductive or digital properties. Normally this involves combining an extremely flexible data conducting material (like fine copper wire) with an existing textile (such as nylon). The most advanced forms of modern e-textile use include conductive thread that incorporates actual sensors and other components including transistors and diodes.

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