

Smart fabric provides "air conditioning" for the wearer adjustable with a mobile app

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VTT Technical Research Centre of Finland has developed a new high-volume production method for hot embossing microscopic channel structures onto large areas of plastic film at a low cost for use, for example, in wearable technology and cosmetic applications. One of VTT's goals is to engineer a smart fabric adjustable with a mobile app for controlling the wearer's temperature.

With VTT's high-volume method, microchannels can be produced on large areas of [plastic film](#) in a short time. Pumping cold or hot liquid through a network of microchannels enables the temperature control of functional clothes.

So far, the utilisation of microscopic channels for other than diagnostic purposes has been limited by relatively high production costs and the small size of the networks of microchannels that can be manufactured through traditional methods.

Microchannels for large surfaces

"Minuscule microfluidic channels can be compared to the cardiovascular system, for example. This gave us the idea for other applications of our new method in addition to diagnostics, such as heating or cooling channels for clothing, or the storage and transport of substances that are only needed in small volumes (perfumes and fragrances) or that are very expensive (medicine)," says VTT's Key Account Manager for Wearable

Technology and Printed Diagnostics, Ralph Liedert.

The channels can be embedded either into hard or soft plastics, depending on the purpose of use. For example, the feel and shape of a soft and elastic plastic film is better suited for integration into a coat compared to rigid plastics, which in turn are better suited for application in card format, such as a handy travel perfume dispenser that is the size of a credit card.. Other possible uses of the thin cards include very precise dosing of medicine or serving strong spices in restaurants.

VTT is currently developing a [smart fabric](#) which can be used as "personalised air conditioning" in outdoor clothing. VTT is now seeking partners within sports, outdoor recreation, [wearable technology](#) and the cosmetics industry for the commercialisation of this new technology.

Provided by VTT Technical Research Centre of Finland

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