

High-tech space agency fabric benefits steelworkers

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The protective underwear prototyped by Swedish Björn Borg for welders in steel mills. The development is thanks to the spin-off initiative of ESA Technology Transfer Programme's Swedish network broker Umbilical Design and the joint effort by the broker, the clothes manufacturer Björn Borg and Jernkontoret, Sweden's Association of Steel Producers. Credit: Umbilical Design

Thanks to ESA and a high-tech fabric used in spacesuits, Swedish

steelworkers will soon be wearing safer and cooler underwear to work.

Cathrin Persson has worked in Sweden's steel industry since 1998. Every morning as she dresses for work, the welder faces the same problem: there are few heat- and fire-resistant [underwear](#) options on the market, and none are designed for women.

So, like most steelworkers, she makes do with normal underwear, which is less than ideal because cotton burns easily and retains heat. For women, regular garments fail to provide adequate coverage around the chest.

"When you're welding, there are sparks flying," Cathrin explains.

"They fall down on you like rain. They make holes in your gear, and eventually, they get on your skin, where they don't stop until they run into something. This is usually the bra, for females."

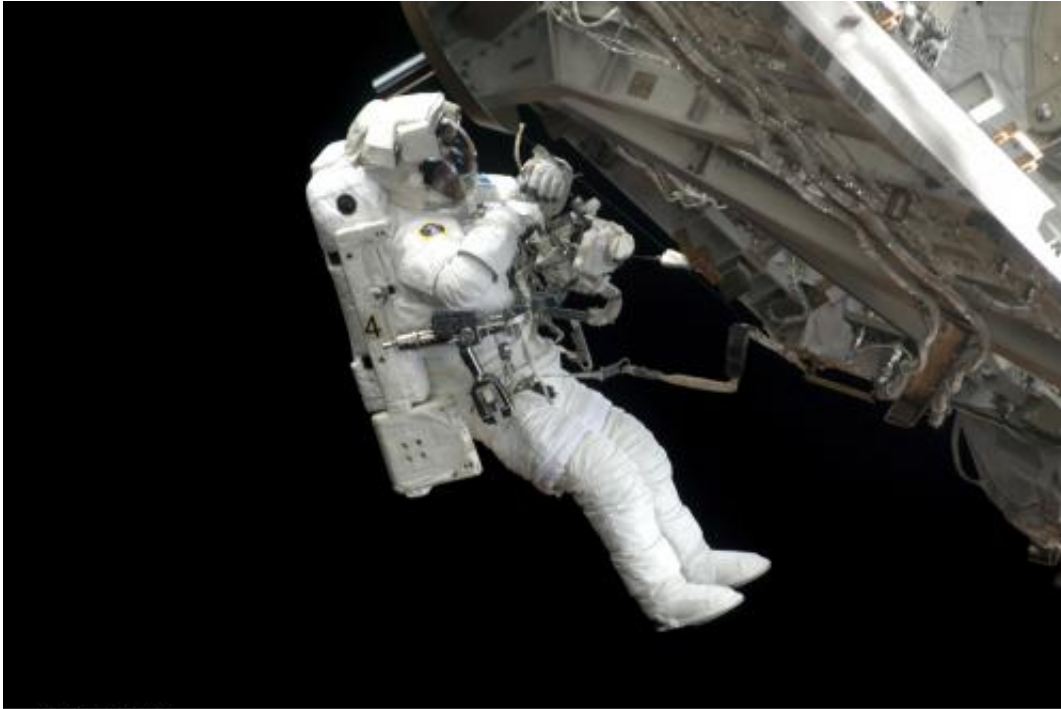
Thanks to technology used in space, however, Cathrin's morning routine could soon change. Using Nomex, a highly resistant fabric used in astronauts' suits, the Swedish underwear company Björn Borg has come up with prototypes for modern undergarments designed specifically to cope with the extreme conditions of a steel mill.

Dubbed "Thunderwear," the new line was launched at a fashion show in Stockholm this summer.

One of five steelworkers who modelled it on the catwalk, Cathrin was impressed with the Nomex: "They held it over an open flame, and it didn't leave any mark."

Even more importantly for a woman who works where steel is baked at temperatures of up to 1050°C, the high-tech material does not hold heat:

"I touched the fabric immediately afterward, and it was lukewarm."



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Christer Fuglesang's spacewalk. Credit: ESA/NASA

The garments owe their existence to ESA's Technology Transfer Programme (TTP). Last year, Sweden's TTP Network broker Cecilia Hertz, of Umbilical Design, came across the problem when talking to representatives of Jernkontoret, Sweden's Association of Steel Producers.

Next, she contacted the underwear makers Björn Borg, who expressed immediate interest. Finally, Cecilia put out a call to the broker network looking for a suitable material from space.

Speaking with TTP's network of European brokers, both UK broker

STFC and Italy's D'Appolonia recommended Nomex. As this flame-resistant material is used in astronauts' suits, experience showed it could maybe fit the bill.

"We have a background in protective garment materials, and we suggested a couple of options," said D'Appolonia's Andrea Maria Ferrari.

Provided by European Space Agency

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