

THERMIUM® INSULATION TECHNOLOGY

FOR GORE-TEX FOOTWEAR

THERMAL COMFORT

IN AN EVEN BROADER RANGE OF TEMPERATURES



CHALLENGE

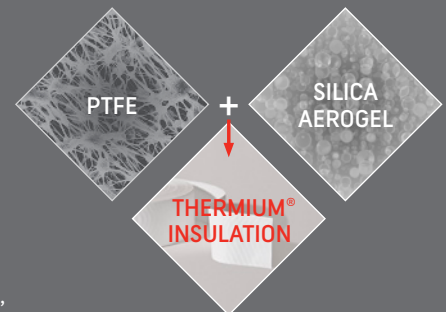
Adding warmth to boots has typically added bulk – reducing the agility and breathability that are critical for maximum footwear performance.

SOLUTION

GORE-TEX THERMIUM® footwear for the police and armed forces is equipped with a novel insulation technology. This results in a low-bulk boot with increased agility and improved thermal comfort in an even broader range of temperatures. And, it is still durably waterproof and breathable.

THE SECRET BEHIND THERMIUM® INSULATION TECHNOLOGY

In creating the patented insulation material for GORE-TEX footwear, Gore applied its extensive knowledge of polytetrafluoroethylene (PTFE), a polymer with highly advanced properties. Combining this polymer with silica aerogel yields a highly innovative, ultra-thin, low-bulk, non-compressible insulation technology.



Developed by NASA for such uses as helping shuttles re-enter the atmosphere, aerogel provides unparalleled insulation. Conventional aerogel insulation is stiff and difficult to manoeuvre.

The encapsulation of aerogel in ePTFE creates a flexible and compression-resistant insulator, with a thickness of about 1.7 mm. The material can be cut and treated like leather and applied to footwear in a way that retains boot breathability and agile performance.

Unlike conventional textile insulation, THERMIUM® insulation technology can be used outside a waterproof barrier, and because of low water pick-up it can maintain its high insulation performance even in a wet environment.

GORE-TEX WATERPROOF & BREATHABLE LAMINATE



THERMIUM® INSULATION TOE BOX

THERMIUM® INSULATION TOE BOTTOM



PATENTED THERMAL MAPPING

Gore has tracked footwear insulation needs through patented thermal mapping, and identified critical areas of the foot, such as the toe box, that tend to be affected the fastest by exposure to cold weather or heat loss. THERMIUM® insulation can be strategically placed in these areas to provide enhanced warmth/heat retention without sacrificing boot shape and design. Adding warmth to footwear has typically added bulk – reducing the agility and breathability that are critical for maximum footwear performance.

OPTIONAL PLACEMENT OF INSULATION



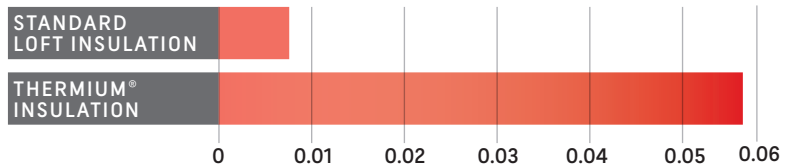
SUPERIOR WARMTH

THERMIUM® insulation technology is engineered to resist compression through the footwear manufacturing process and life of the boot. This innovative insulation material can be built into winter, summer or all-season GORE-TEX footwear. It always delivers thermal protection in an even broader range of temperatures without adding bulk, or compromising mobility and breathability.

COMPREHENSIVE TESTING

In creating THERMIUM® insulation technology, Gore leveraged in-depth studies of human physiology along with leading-edge innovations in materials development. GORE-TEX Footwear with THERMIUM® insulation technology has been extensively tested in an independent climate chamber, as well as in on-the-ground trials in the U.S. and Europe.

Maintains insulation under compression | Rc at 100 kPa

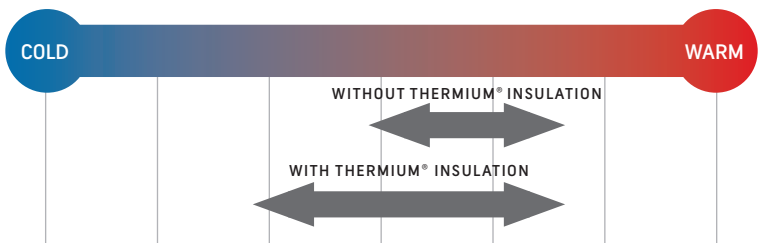


Warmth = R_c = Resistance to thermal conductivity
100 kilopascal (kPa) is the approximate compression of a person standing up

THERMIUM® INSULATION TECHNOLOGY DELIVERS

- ◆ Enhanced insulation technology that improves cold climate comfort
- ◆ Enduring comfort and protection across an extended range of temperatures
- ◆ Hydrophobic properties, enable consistent insulation in wet and dry conditions
- ◆ Continuous versatility, enabling customization through various shapes, layers, and designs
- ◆ Seamless integration into existing manufacturing processes

THERMIUM® INSULATION TECHNOLOGY BROADENS THE TEMPERATURE RANGE



No reduction of breathability / higher insulation without added weight while keeping mobility & agility

