

# GORE-TEX THERMIUM™ INSULATION

FOR DEFENSE FOOTWEAR

## ULTRA-THIN, LOW-BULK, NON-COMPRESSIBLE NOVEL INSULATION TECHNOLOGY

**GORE-TEX**  
PRODUCTS

**GORE**

### CHALLENGE

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

### SOLUTION

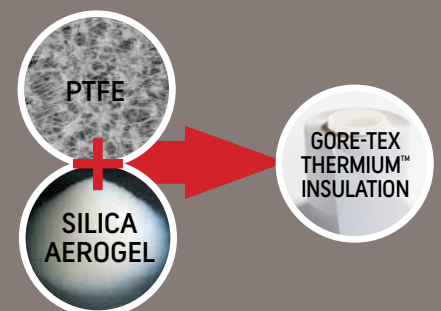
GORE-TEX defense footwear with THERMIUM™ insulation addresses this challenge by introducing its patented ultra-thin, low-bulk, noncompressible insulation engineered to provide improved thermal comfort over an extended range of temperatures.

### THE SECRET BEHIND GORE-TEX THERMIUM™ INSULATION

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, the world's lightest solid element and best solid thermal insulator, yields an innovative insulation technology.

Developed by NASA for such uses as helping shuttles re-enter the atmosphere, aerogel provides unparalleled insulation. On its own, the aerogel is stiff and difficult to maneuver. The addition of PTFE 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 combat boots in a way that retains boot breathability and agile performance.

Unlike conventional textile insulation, GORE-TEX THERMIUM™ insulation 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.

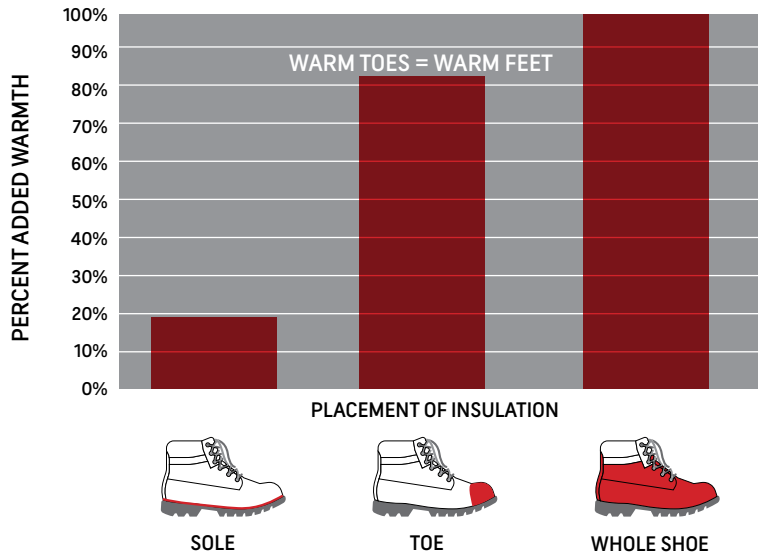




**PATENTED THERMAL MAPPING**

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. GORE-TEX THERMIUM™ insulation can be strategically placed in these areas to provide enhanced warmth/heat retention without sacrificing boot shape and design. Adding warmth to combat boots has typically added bulk – reducing the agility and breathability that are critical for maximum footwear performance.

**GORE-TEX THERMIUM™ INSULATION IMPROVES WARMTH WHEN PLACED IN CRITICAL AREAS**



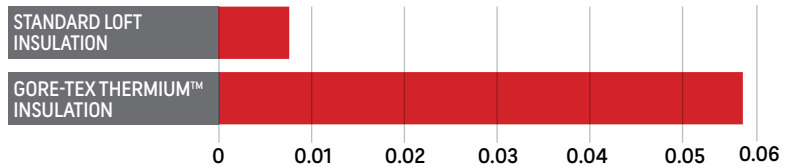
**SUPERIOR WARMTH**

GORE-TEX THERMIUM™ insulation is engineered to resist compression through the footwear manufacturing process and life of the boot. It delivers additional thermal protection in an already insulated GORE-TEX cold weather boot. And, provides cold weather protection in a noninsulated temperate weather boot without adding bulk, or compromising mobility and breathability.

**COMPREHENSIVE TESTING**

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

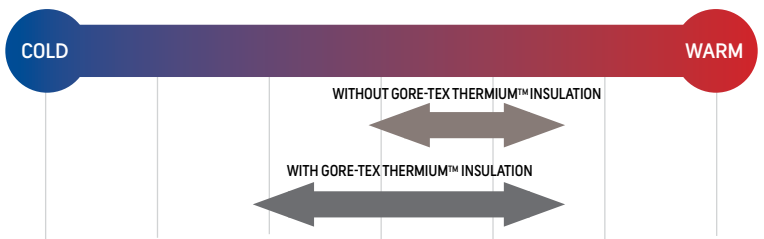
**MAINTAINS INSULATION UNDER COMPRESSION | Rc @ 100 kPa**



Warmth = Rc = Resistance to thermal conductivity

100 kilopascal (kPa) is the approximate compression of a person standing up

**GORE-TEX THERMIUM™ INSULATION BROADENS THE TEMPERATURE RANGE**



**NO REDUCTION OF BREATHABILITY | HIGHER INSULATION WITHOUT ADDED WEIGHT WHILE KEEPING MOBILITY & AGILITY**

**GORE-TEX THERMIUM™ INSULATION 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

