



» PRODUCT BULLETIN

Composite Heat Release Technology for Firearm Barrels

Firearm manufacturers are constantly seeking new and innovative ways to improve performance and overall customer appeal. The configuration of the barrel is a key factor that can affect the accuracy as well the aesthetics of the firearm.

Avient Composite Heat Release is a new, patent-pending material innovation that can help manufacturers reduce weight and add stiffness to firearm barrels. The proprietary, multi-layer carbon fiber and ceramic composite technology applies the concept of thermal inertia to expedite heat transfer from the barrel bore to improve overall performance.

KEY CHARACTERISTICS

- Incorporates ceramic and carbon fiber reinforced composite onto a manufacturer-provided, Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) compliant steel barrel blank
- Reduces overall barrel weight
- Increases barrel stiffness
- Improves heat transfer and reduces barrel bore temperature over multiple rounds



THERMAL CONDUCTIVITY VS. THERMAL INERTIA

Thermal conductivity has traditionally been the primary metric considered for material selection to manage heat. It measures how well a material absorbs energy in the form of heat but does not measure how well it releases the heat. Higher density materials absorb more energy than lower densities, so materials like steel have higher thermal conductivity than less-dense ceramics.

In contrast, **thermal inertia** measures how quickly a material returns to ambient temperature after heating.

Materials exhibiting lower thermal inertia cool faster due to less resistance in releasing heat from the material into the air. Higher density materials typically have higher thermal inertia, or cool more slowly, than lower density materials.

Avient's Composite Heat Release technology leverages the concept of thermal inertia to reduce internal barrel temperatures. The ceramic middle layer has been specially formulated by Avient to reduce thermal inertia and transfer heat outward from the steel bore quickly.

THE BOTTOM LINE
Barrels made with Composite Heat Release technology can be lighter, heat slower, and cool faster than traditional steel or carbon-wrapped steel barrels.

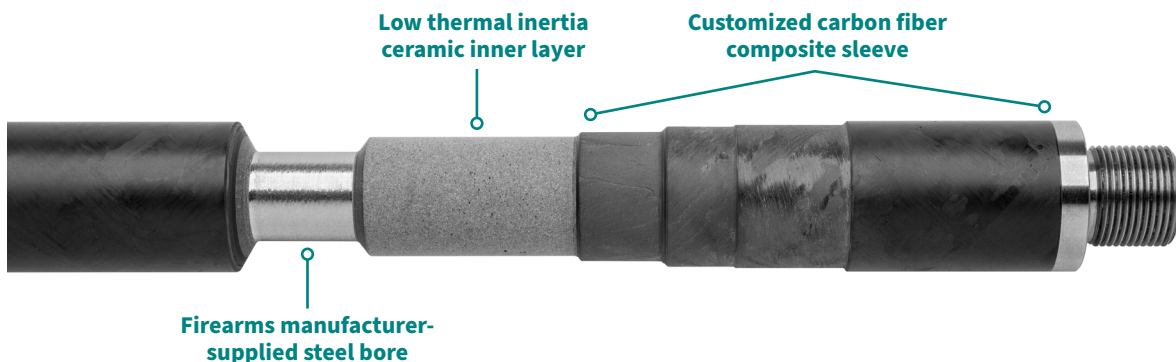
HOW WE WORK WITH YOU

Avient's engineering and technical experts work closely with firearms manufacturers in the barrel development process to understand their needs and requirements, and to customize a solution.

The internal steel barrel bores are fabricated by the firearms manufacturer to their specifications and SAAMI compliance and are supplied to Avient. The ceramic and carbon fiber composite layers are applied in a proprietary process, and finished barrels are returned to the firearms manufacturer for incorporation into the final product.

This unique and collaborative design and fabrication process enables firearms manufacturers to achieve a completely customized barrel, from the inner bore to the carbon fiber composite wrap.

For more information, please contact Avient to speak with our Outdoor High Performance material experts.



1.844.4AVIENT
www.avient.com



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