

# What is **TECGEN71**?

TECGEN71 is a rip twill **6.5 oz/yd<sup>2</sup>** outer shell that is constructed of 60/40 Kevlar<sup>®</sup>/Nomex<sup>®</sup> on the face of the fabric, and a carbon-based TECGEN<sup>®</sup> fiber on the inside sold exclusively by Fire-Dex.

While positioned as a lighter weight option, TECGEN71 is in fact no lighter weight than other proven outer shells used in the fire service today such as PBI Max **6 oz/yd<sup>2</sup>**. TECGEN71 is simply offered with light thermal liners and moisture barriers. The same result can be achieved by using those same thermal liners and moisture barriers with other lightweight outer shells, containing proven fibers like PBI, Kevlar<sup>®</sup> and Nomex<sup>®</sup>...but without the flaws of the carbon-based TECGEN<sup>®</sup> fiber.

The most alarming compromise in choosing TECGEN71 is the lack of durability and the rapid strength loss after exposure to UV.

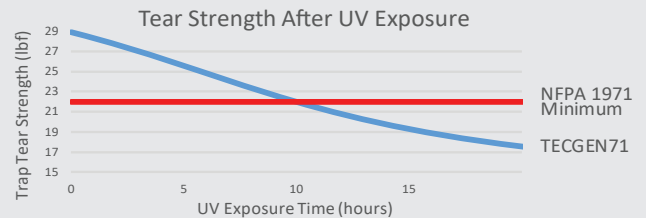
Test results show that **after only 20 hours** of exposure to UV, TECGEN71 tear strength falls to **17 lb, below the minimum NFPA 1971 requirement of 22lb**

On its website, Fire-Dex emphasizes the importance of durability and tear strength testing for all outer shells. It states:

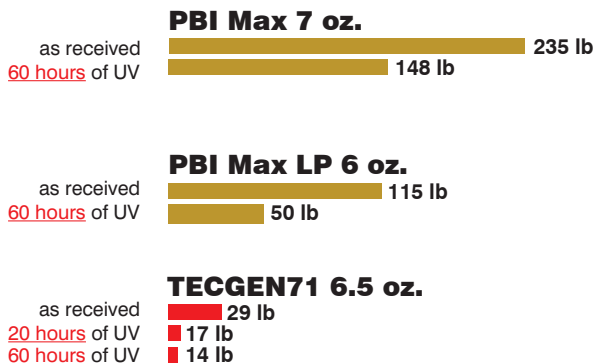
“ Wearing fabric that tests poorly can lead to a shorter life-span for turnout gear, other garment failures and increased risk of burns. ”

URL: <https://www.firedex.com/product/tecgen71/>

While Fire-Dex recognizes the importance of exceeding the NFPA 1971 minimum requirement of 22 lb of tear strength, the test data results for TECGEN71 tell a different story.



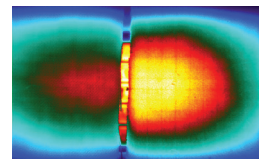
## Tear Strength Comparison



## The high thermal conductivity of TECGEN71 can increase heat stress.

Another factor to consider when choosing an outer shell is **thermal conductivity**. Highly conductive fibers, like carbon fiber, will increase the rate at which heat is transferred into the gear. TECGEN71 outer shell transfers heat through the garment significantly faster than PBI, thus making the firefighter hotter, faster.

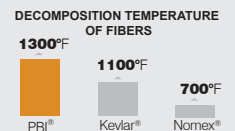
The thermal image below depicts PBI Max and TECGEN71, simultaneously exposed to approximately 0.5 cal/cm<sup>2</sup>-s of radiant heat for 15 seconds



PBI Max TECGEN71

There are many reasons why carbon-based fabrics haven't seen traction in the fire service since first being introduced in the 1990s. While Fire-Dex is focused on heat stress, TECGEN71 falls short of being the answer.

There are many reasons why carbon-based fabrics haven't seen traction in the fire service since first being introduced in the 1990s. Nomex/Kevlar fabrics are known for their affordability but offer a much lower level of protection when compared to PBI blends, which provide a decomposition temperature of 1175°+. Another factor has been long-term durability. Carbon-based fabrics have failed to prove their overall durability and performance in the field.



## Test it and prove it

As with all the tests performed on turnout gear, only so much can be replicated in a laboratory. The real test is wearing the garment and assessing the fabric durability in the field. That's why it is imperative for any department considering TECGEN 71 to perform an extensive field evaluation to assess how the outer shell performs after at least a year of use. The results can make the difference between the right and wrong decision for your protective needs.