



Outer Shells



Durability, Flexibility and Thermal Protection – Guaranteed.



Millenia™ XT



Maximum Protection & Durability

TenCate Millenia™ XT makes an extreme leap forward in outer shell protection and durability. It outperforms every other premium outer shell fabric in tear strength, tensile strength, strength after thermal exposure and durability. With this landmark advance in textiles technology, TenCate introduces a new generation of strength, reinforcing its unparalleled tradition of leadership through innovation.

- **Best initial strength** – Greater strength than any competitive outer shell.
- **Highest thermal stability** – Retains strength and flexibility even after thermal exposure.
- **Greatest strength retention** – 250% stronger after thermal exposure than any competitive outer shell.
- **Unmatched durability** – Unbeatable in durability and overall wear life. Top performance in abrasion resistance.



Gemini™ with MATRIX™ technology

Excellent Performance & Protection

TenCate Gemini™ combines the proven performance of Pbi with the advanced engineering expertise of TenCate. The thermal resistance of Pbi and Kevlar® spun yarns are reinforced with an enhanced Matrix™ technology filament grid to provide the high performance you need when it counts most.

- **Advanced engineering** – Gemini™ features a patented high tech grid of composite filament & spun yarns and Matrix™ technology that provides strength, reduces abrasion and eliminates puckering.
- **Superior durability** – 5-7 times better abrasion resistance than competitive Pbi fabrics.
- **Excellent thermal protection** – Strong and flexible before and after thermal exposure.



Advance ultra®

Exceptional Protection & Value

TenCate Advance Ultra® offers an exceptional balance of thermal protection, strength, durability and value. Its unique construction, engineered from an innovative triple fiber blend, provides superior strength, durability and thermal protection that stands up to the heat.

- **Exceptional thermal protection** – Strong and flexible before and after thermal exposure.
- **Exceptional abrasion resistance** – Resists abrasion, holes and tears.
- **Exceptional value** – Offers reliable, long-lasting, durable protection at the greatest value.



Advance™

Proven Performance & Value

TenCate Advance™ has been protecting firefighters for nearly two decades. Its innovative construction provides dependable thermal protection and durability. This hardworking fabric offers proven performance and good value.

- **Proven performance** – Almost two decades of proven performance in the field.
- **Dependable thermal protection** – Stands up to the heat better than 100% Nomex outer shell fabrics.
- **Good value** – Hardworking outer shell at an affordable price.

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PHYSICAL PROPERTIES	TenCate Millenia™XT	TenCate Gemini™	TenCate Advance Ultra®	TenCate Advance™	NFPA 1971 Requirements
Fiber Blend:	60% Para-Aramid 40% PBO	60% Kevlar® 40% Pbi reinforced with Para-Aramid filament networks	60% Kevlar® 20% Meta-aramid 20% PBO	60% Kevlar® 40% Nomex®	
Weight:	7.5 oz (sq yd)	7.5 oz (sq yd)	7.5 oz (sq yd)	7.0 oz (sq yd)	
Weave:	Rip-Stop	Modified Plain	Rip-Stop	Rip-Stop	
Colors:	Natural (Gold),	Natural (Gold), Black	Yellow, Light Gold, Dark Gold	Khaki, Yellow, Gold, Navy, Black	
Finish:	Super Shelltite™	Super Shelltite™	Super Shelltite™	Super Shelltite™, Shelltite™	
Trapezoidal Tear Strength (lbs) ASTM D 5587* Initial (warp x fill) After 10 launderings (warp x fill)	90 x 75 80 x 70	45 x 45 35 x 35	45 x 45 40 x 35	40 x 35 35 x 30	22.0 min
Tensile Strength (lbs) ASTM D 5034 Initial (warp x fill) After 10 launderings (warp x fill)	655 x 640 575 x 565	290 x 260 230 x 220	440 x 420 320 x 310	320 x 280 270 x 250	140.0 min
Tensile Strength (lbs) after 17.5-second TPP Exposure (2.0 cal/cm²•sec) (warp x fill)	150 x 135	75 x 50	110 x 100	15 x 10	
Water Absorption Resistance (%) AATCC 42 Initial After 5 launderings	< 1.0 < 1.0	< 1.0 < 10.0	< 1.0 < 2.5	< 3.0 < 10.0	30.0 max
Flame Resistance ASTM D 6413 Char Length in inches (warp x fill) (Initial) Char Length in inches (warp x fill) (After 5 launderings) After Flame in seconds (warp x fill)	0.2 x 0.0 0.0 x 0.0 0.0 x 0.0	0.2 x 0.2 0.2 x 0.2 0.0 x 0.0	0.1 x 0.1 0.1 x 0.1 0.0 x 0.0	0.6 x 0.6 0.5 x 0.5 0.0 x 0.0	4.0 max 2.0 max
Laundry Shrinkage (%) AATCC 135 After 5 launderings (cotton sturdy cycle) (warp x fill)	< 3.0 x < 3.0	< 3.5 x < 2.5	< 5.0 x < 5.0	< 5.0 x < 5.0	5.0 max
Heat & Thermal Shrinkage (%) NFPA 1971 500°F for 5 minutes After 5 launderings	< 1.0 < 1.0	< 1.5 < 2.0	< 1.0 < 1.0	< 0.5 < 1.0	10.0 max

*NFPA 1971 specifies Trapezoidal Tear Strength measurement according to ASTM D 5587 not allowing for specimen slippage.



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Sunlight/UV Exposure Advisory: Prolonged sunlight and UV exposure can be damaging to aramid and PBO fibers. Both natural (undyed) and dyed aramid and PBO fibers will fade or change color with exposure to sunlight or other UV sources. The thermal performance is not affected, but long term or repeated exposures will cause the fabric to gradually weaken. Garments should be stored so that they are protected from sunlight, including windows and bay doors, to maximize wear life. TenCate Protective Fabrics offers no warranties, implied or otherwise, for color change or fabric damage due to UV exposure.

All listed test data and ranges represent typical values. All test data and ranges are the result of multiple tests unless otherwise stated. To the best of our knowledge, the information contained herein is accurate. However, TenCate Protective Fabrics assumes no liability whatsoever for the accuracy or completeness of the information contained herein. Users of any substance must satisfy themselves by independent investigation that the material can be used safely. We have described certain hazards, but we cannot guarantee that these are the only hazards.

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