

Outer shell: MI 9180 – 180 g/m<sup>2</sup>

## The world's strongest and lightest outer shell

Decades of experience in advanced textile technology combined with use of the world's strongest fibre (PBO) have led to a truly unique fabric: TenCate Millenia™. This extremely lightweight outer-shell fabric not only offers unmatched performance in strength, but is also safer, since it does not break open after exposure to heat and flame. This combination makes the TenCate Millenia™ outer-shell fabric the lightest and strongest fabric available on the market today.

**Outstanding comfort** – The lightest outer shell fabric available. Helps to protect against heat stress and allows for longer working hours.

**Premium thermal performance** – Exhibits exceptional strength retention after exposure to heat as well as excellent flame resistance.

**Superior tear and tensile strength** – Provides outstanding resistance to cuts and punctures.

**Unbeatable durability** – Can continually withstand the toughest challenges due to unequalled durability and wear life.

**Limited chemical protection** – Protects against splashes, thanks to Hydro-Tec™ finish.

**Anti-static for explosion risk protection** – TenCate Static-Control™ is a core conductive filament yarn (complies with EN 1149-5: 2008, test method EN 1149-3: 2004).

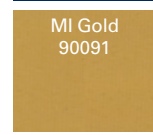
**Complete system** – TenCate Millenia™ MI 9180 is the outer-shell component that is part of the lightest and strongest system available on the market – the TenCate Millenia™ 450 system – and is certified to EN 469: 2005, Level 2.

These fabrics are made by TenCate Protective Fabrics, the largest supplier of FR fabrics in the world.



Technical data	TenCate Millenia™	Test method
Quality	MI 9180	
Width	163 cm (+2/-1 cm)	ISO 22198: 2006
Weight	180 g/m <sup>2</sup> (± 5%)	ISO 3801: 1977
Composition	59/39/2% para-aramid/PBO/Static-Control™	
Construction	1/1 plain, ripstop	
Protection	Outer shell for turnout gear	
Available finishes	Hydro-Tec™	
PPE* requirements		
Washing symbols		
Certification		
	Firefighting	EN 469: 2005
	Industrial flame & heat hazards	EN ISO 11612 A1,A2,B1,C1,F1: 2008
	Anti-static for explosion risk	EN 1149-5: 2008, EN 1149-3: 2004
	Öko-Tex Standard 100, class III	

**Standard colours**



The colour above is a standard colour and available with a minimum order length of 100 metres. The colour shown is of reference only.

- \* Copyright symbols: NEN, Delft (Netherlands)
- \*\* After pre-treatment (five wash/dry cycles according to EN ISO 6330: 2000. Procedure 2A (60°C) with tumble drying (Procedure E) (max. 70°C outlet temperature).
- \*\*\* As received

**Summary of results EN 469: 2005**

Property	Test method	EN 469: 2005 requirements	Results obtained	PASS
6.1 Flame spread	EN ISO 15025: 2002 Procedure A	ISO 14116 index 3: No flaming to edge - No hole formation - No flaming or molten debris - Mean afterflame ≤ 2s - Afterglow not to spread	ISO 14116 index 3: No flaming to edge - No hole formation - No flaming or molten debris - No afterflame - No afterglow	PASS**
6.4 Residual strength	EN ISO 6942: 2002 Method A at 10 kW/m <sup>2</sup>	Tensile strength (ISO 13934-1) of outer material ≥ 450N	Warp average: 2600 N Weft average: 2900 N	PASS**
6.5 Heat resistance	ISO 17493: 2000 at 180 °C	Materials shall not ignite or melt. Shrinkage ≤ 5%	Material did not ignite or melt. Max. Shrinkage: 0.1%	PASS***
6.6 Tensile strength	EN ISO 13934-1: 2013	≥ 450 N	Warp: 3100 N Weft: 3100 N	PASS***
6.7 Tear strength	EN ISO 13937-2: 2001	≥ 25 N	Warp: 370 N Weft: 340 N	PASS***
6.8 Surface wetting	EN 24920: 1992	Spray rating ≥ 4 (based on lowest result)	Spray rating = 5	PASS**
6.9 Dimensional change	ISO 5077: 2007	Max ± 3% (= shrinkage)	< 3%	PASS**

**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.



**TenCate Protective Fabrics**

TenCate is the world's No. 1 producer of protective fabrics for the manufacturing of safety wear. We supply garment-makers with an extensive range of top-quality and technologically advanced fabrics.

Our fabrics become lifesaving garments for firefighters, industrial workers, military personnel and other professionals working under hazardous conditions in danger zones around the world.

We work closely with our customers, end-users, fibre and chemical manufacturers and independent laboratories. As a result, TenCate Protective Fabrics is the one source the world looks to for leadership in knowledge of materials, consistent product quality, and a proven commitment to service excellence.

TenCate is a trademark of Royal Ten Cate nv. TenCate Millenia™ is a trademark of Ten Cate Protect bv. Ten Cate Protect bv is a subsidiary of Royal Ten Cate nv.



TEN CATE PROTECT BV  
TenCate Protective Fabrics  
P.O. Box 186  
7440 AD Nijverdal  
The Netherlands  
Tel. +31 (0)548 633922  
Fax +31 (0)548 633256  
E-mail: protectivefabrics@tencate.com  
[www.tencateprotectivefabrics.com](http://www.tencateprotectivefabrics.com)