

# TenCate GeoDetect® S

Fiber Optic Sensing Geosynthetics

## OUR COMPANY

TenCate develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

## OUR PRODUCT

The use of fiber optics in structural health monitoring systems for civil engineering applications have been widely used for many years. By integrating fiber optic sensing into a geosynthetic fabric, TenCate GeoDetect® is the first system designed specifically for geotechnical applications. The TenCate GeoDetect® S solution embodies a strip of geocomposite fabric, fiber optics, software and instrumentation to provide an innovative solution for the multifunctional requirements of a geotechnical application, e.g. in-plane drainage capability, anchoring interface with the soil, protection of the optical fiber, reinforcement in addition to data capture. TenCate GeoDetect® S uses Fiber Bragg Gratings (FBG) technology to measure strain and/or temperature in soil structures. Compact and easy to install, TenCate GeoDetect® S is 1m wide by 10m long. Eleven FBG sensors are strategically inserted onto the two special optical fibers embedded onto each TenCate GeoDetect® S strip approximately 1m apart. Strain measurements as low as 0.02% can be obtained with a spatial resolution of 0.5m. TenCate GeoDetect® S is an innovation that provides:

- Assurance the design materials are meeting or exceeding expected factors of performance, thereby limiting potential liability.

- Early warning indication of changes in material performance or local conditions that were not expected, e.g. high strains, subsidence, voids, etc.

- Indication that material strengths as called for in design protocols, may be better than anticipated (or not better) for certain applications, opening the door for design protocol changes and cost reductions that are beneficial for both the owner and contractor.

- Increased operating safety margin on certain demanding soil reinforcement applications, e.g. walls, steep slopes, soft soils and subsidence regions.

- Owners a means to utilize geosynthetics in applications that were previously not considered because of insufficient design knowledge and long-term performance uncertainty.

- Owners of high value soil structures with information that can be used to lower long term liability, broaden geosynthetic applications, and allow safe use of certain geo-structures that are not typically considered by design engineers.

- Owners and design engineers a more effective means of employing geosynthetic materials in demanding applications, leading to better land use, lower overall project costs, and increased margins of safety.

- Solutions that have a positive impact on sustainability with lower risk and longer lasting structures due to its ability to monitor appropriate performance.

## OUR APPLICATIONS

The TenCate GeoDetect® S solution is ideal for:

- Walls
- Embankments
- Slopes
- Levees
- Roads/Rails
- Landfills
- Pipelines

## OUR SERVICE

TenCate offers complete technical assistance. Our comprehensive service includes assistance during design, specification and throughout the process. TenCate makes the difference.



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TenCate GeoDetect® Fiber Optic

## TECHNICAL DATA

Fiber Optic	Units	FBG
Minimum diameter	mm	0.9
Minimum strain detection	%	0.02
Number of single mode cable		2
Connection to the textile		Rachel (tight) knitting yarn
Number of Fiber Bragg Gratings		11
Elongation at break		≥ 5%

  

TenCate GeoDetect® S Composite Strip	Test Method	Units	Typical Values
Tensile strength	EN ISO 10319	kN/m	MD/CD 37/12
Elongation at maximum strength	EN ISO 10319	%	MD/CD 11.5/85
Tensile strength at 2% strain	EN ISO 10319	kN/m	MD 7.5
Tensile strength at 5% strain	EN ISO 10319	KN/m	MD 14
Friction properties in contact with sand (:40°)	EN ISO 12957-1	degrees	30°
Puncture resistance (CBR)	EN ISO 12236	kN	2.4
In the plane water flow capacity @ 20 kPa	EN ISO 12958	m3/s/m	20 10-7
Weight per unit area (without optical cables)		g/m <sup>2</sup>	290
Standard width (1)		m	1
Standard Length(1)		m	10

MD: Machine Direction, also direction of the optical cables

CD: Cross Direction

(1) Custom roll sizes available

The values given are average values obtained in our laboratory and in accredited testing institutes. The information given in this datasheet is to the best of our knowledge true and correct. However new research results and practical experience can make revision necessary. The right is reserved to make changes without notice at any time. No guarantee or liability can be drawn from the information mentioned herein.

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Advanced Armour

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Industrial Fabrics  
Grass