12.1080 MUST SMARTGeoTex FABRIC

TenCate GeoDetect® S

Fiber Bragg Grating (FBG) Strain sensors in a geotextile

GENERAL DESCRIPTION

Geotextile structures, beside reinforcing capability in the field of geotechnical engineering, can be also equipped with Fibre Optic sensors for monitoring purposes. Thus MuST SMARTGeoTex Fabric becomes an innovative solution that combines the benefits of using geosynthetic materials with the sensing capabilities of Fiber Optic for geotechnical applications and structural health monitoring.

The MuST SMARTGeoTex Fabric uses Fiber Bragg Grating (FBG) technology combined with the TenCate geosynthetics material to measure in soil structures. Eleven FBG sensors are strategically inserted onto two optical fibres embedded onto a 1m wide by 10m long geotextile.

The geosynthetic provides filtering capability in order to prevent scouring phenomena around the sensor and increase the surface of contact hence improving the mechanical coupling with the surrounding soil.

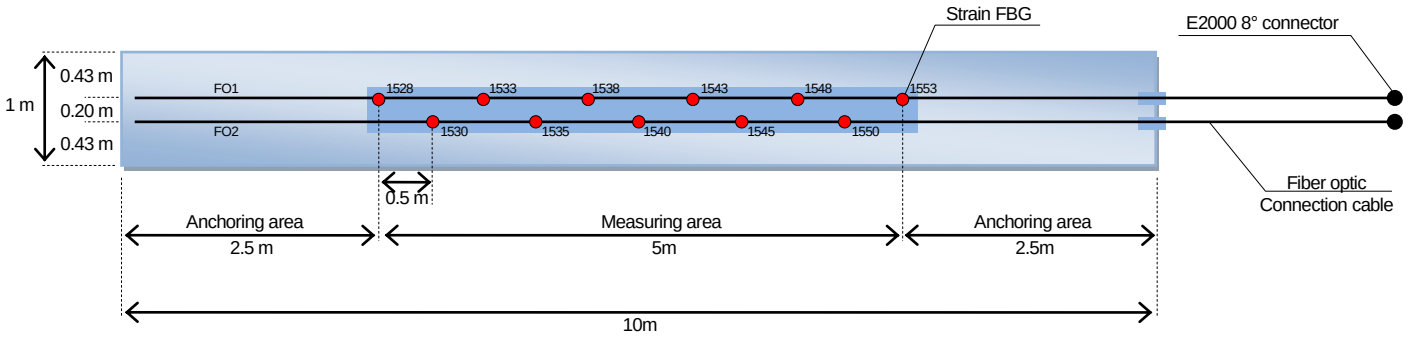
The MuST SMARTGeoTex Fabric sensor is especially suitable for ground settlements and displacements detection in geotechnical structures such as walls, embankments, slopes, levees, roads/rails, landfills or pipelines.

The MuST SMARTGeoTex Fabric sensor is fully compatible with the MuST system and can be combined with other MuST sensors, such as Temperature, Deformation, Tilt and Acceleration (vibration) sensors.

FEATURES

- Sensor integration in geotextiles for in-field geotechnical application
- Good mechanical coupling with the surrounding soil thanks to filtering capabilities of the geotextile
- MuST compatible
- Mechanically reinforced
- Chemically resistant
- Easy and rapid installation
- Light weight and small dimensions

SENSOR CONFIGURATION



PERFORMANCES

MuST SMARTGeoTex Fabric	Test Method	Units		Typical Values
Tensile strength	EN ISO 10319	kN/m	MD/CD	37 / 12 (1)
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	$m^3/s/m$		$20\ 10^{-7}$
Weight per unit area (without optical cables)		g/m^2		290
Standard width		m		1
Standard length		m		10
Max. measurable ε	5%			
Temperature compensation	No			
Fiber optic connection cable (see Smartec datasheet SDS 40.1020)	Standard cable (gray) Stainless steel reinforced cable (black)			
Wavelengths [nm]	FO1 : 1528 1533 1538 1543 1548 1553			
	FO2 : 1530 1535 1540 1545 1550			

MD: Machine direction, also direction of the FO sensors
CD: Cross direction

(1) Higher strengths on demand

ORDERING INFORMATION

Connection cable type and length

Smartec SA · Via Pobiette 11, CH-6928 Manno, SWITZERLAND · **Phone** +41 91 610 1800 · **Fax** +41 91 610 1801 · smartec@smartec.ch · **www.smartec.ch**