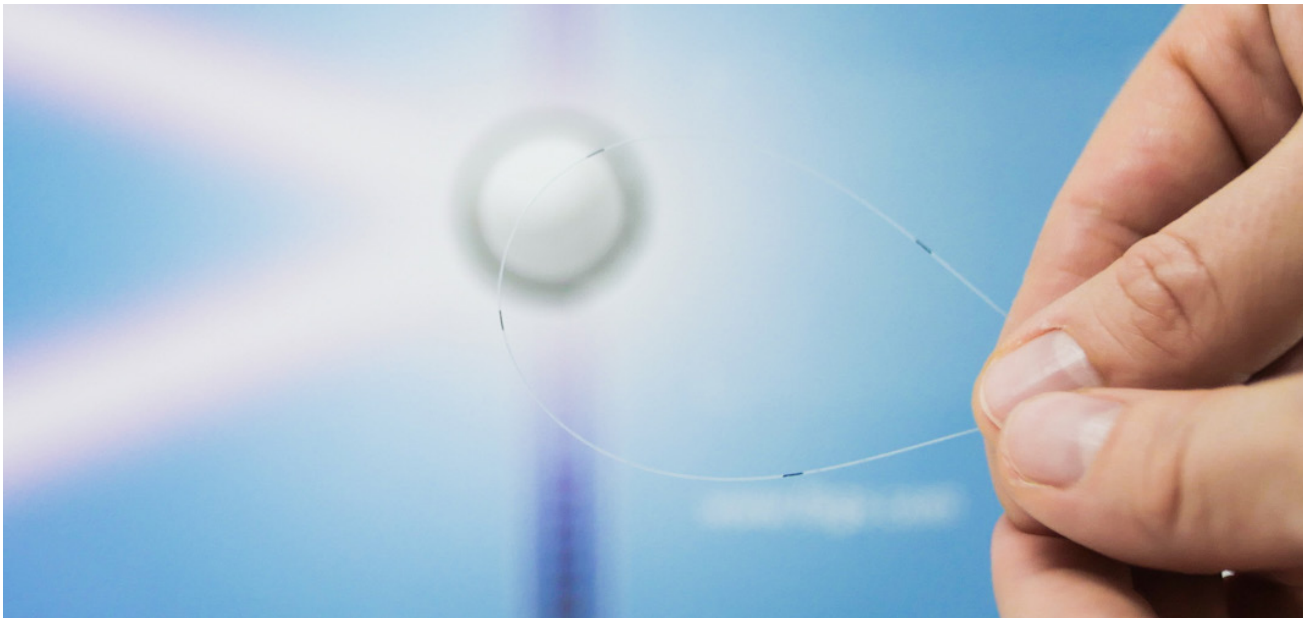
FBGS
Tailored Fiber Optic Sensing
Components & Solutions

Draw Tower Gratings (DTG®s) in Low Bend Loss fiber LBL-1550-125



INFO

Draw Tower Gratings (DTG®s) are produced during the drawing process of the fiber itself, before the primary coating is applied.

This is a cost effective production process for high quality Fiber Bragg Gratings.
This offers unique characteristics such as extremely high breaking strength, insensitivity to bending, spliceless array configurations and uniform coating coverage. FBG parameters and coating material can be selected based on customer needs.

Description

Draw Tower Gratings (DTG®s) are produced using a process that combines the drawing of the optical fiber with the writing of the Fiber Bragg Gratings (FBGs). The fiber coating is applied directly after the grating inscription. This process results in spliceless, high strength FBG chains. The commonly used stripping and recoating process of standard FBGs becomes redundant and the pristine fiber strength is maintained beyond the DTG® manufacturing process. The Low Bend Loss fiber LBL-1550-125 has a cladding diameter of 125µm and is optimized for operation in the 1550nm wavelength window. The glass composition has been tuned such that the fiber maintains a good signal transmission under small bending diameters.

Features

- Extremely high mechanical strength compared to conventional gratings (> 5% strain)
- Spliceless FBG chains with a high number of sensor elements
- FBG wavelengths can be varied between 1460 to 1620nm in one FBG chain
- Low bend loss fiber (high NA fiber)
- Available in different coating types: ORMOCER®, ORMOCER®-T and One layer Acrylate
- High operating temperature range (from -200° to +200°C) using ORMOCER® and ORMOCER®-T coatings
- Excellent strain transfer without coating removal when using ORMOCER® coating
- The coating is uniform along the complete fiber length, even at the FBG position

Specifications

Standard Specification

[1] Measured at room temperature

[2] Ormocer is mainly applied for strain measurements while Ormocer-T is recommended for temperature measurements. (see FBGS website for more info)

[3] According to IEC-60793-1-31 using a constant displacement of 30mm/minute

[4] Measured between 0°C and 70°C

[5] Temperature range is dependent on exposure time

ORMOCER®

Trademark of Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

Parameter	DTG-A3
Reflectivity (for grating length of 8 mm)	>15%
FWHM (for grating length of 8 mm)	100 pm
Centre wavelength (extended range upon request)	1450 nm to 1650 nm
Absolute Wavelength accuracy[1]	≤ 0.3 nm
Relative Wavelength accuracy	≤ 0.3 nm
Side Lobe Suppression (SLS)	≥ 10 dB (typical)
DTG® length	2 to 10 mm / 8 mm (typical)
Attenuation	< 8.6 dB/km
Mode Field Diameter (MFD) @ 1550nm	6 µm (typical)
Numerical Aperture (NA)	0.26 (typical)
Cladding diameter	125 µm ± 1 µm
Coating type[2]	ORMOCER®/ORMOCER®-T / One layer Acrylate
Coated fibre diameter	195 µm (typical)
Tensile load at break[3]	> 50 N (corresponds to >5% strain)
Temperature sensitivity[4] (formula: $\Delta\lambda/(\lambda \times \Delta T)$)	6.5 K^{-1} x 10^{-6} (typical)
Strain sensitivity[1] (formula: $\Delta\lambda/(\lambda \times \Delta\varepsilon)$)	7.8 $\mu\varepsilon^{-1}$ x 10^{-7} (typical)
Operational temperature range[5]	-200°C to 200°C for ORMOCER®
	-20°C to 200°C for ORMOCER®-T
	-20°C to 90°C for One layer Acrylate

Ordering Informations

V Specify product-code:

DTG	-	A3	XX	-	Y	Z

XX = Coating type
- A4: ORMOCER®
- B4: One Layer Acrylate
- C4: ORMOCER®-T

Y=lead-in connector

Z=lead-out connector

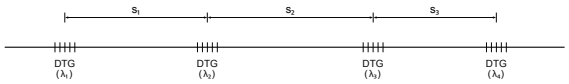
Y / Z	
A	FC/APC
B	LC/APC
C	SC/APC
D	E2000
E	spliced FC/APC
F	spliced LC/APC
G	spliced SC/APC
H	spliced E2000

V Specify wavelength:

		Position from start [mm]	Wavelength [nm]
Chain configuration	Start of section	0	
	DTG 1		
	DTG 2		
	DTG n		
	End of section		

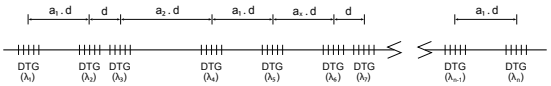
Configuration possibilities

Long distance spacing:



Specification: s1, s2, s3, ... > 50 cm | λ1 ≤ λ2 ≤ λ3 ≤ …

Short and equidistant distance
Constant and flexible spacing:



Specification:
length d shortest distance between successive DTG®s (10 mm ≤ d ≤ 500 mm)
a1, a2, ..., ax is (integer) multiple of shortest distance d
λ1, λ2, …, λn: wavelengths of the DTG®s, where λ1 < λ2 < ... < λn
guiding value for maximum wavelength difference: 50 nm per 1 cm distance

Special configurations of DTG®s upon request.

FBGS International NV, Bell Telephonelaan 2H, B-2440 Geel, Belgium, M info@fbgs.com, T +32 14 58 11 91 | www.fbgs.com
FBGS International NV reserves the right to make changes without further notice to any products.
FBGS International NV v15008_5. All rights reserved.