FBGS
DRAW TOWER GRATINGS

Draw Tower Grating (DTG®'s) in reduced cladding fibers

Description

The DTG®'s in reduced cladding fibers are Draw Tower Gratings written into an 80µm glass fiber. These DTG's offer some exciting opportunities compared to the standard 125µm DTG fibers. Because the fiber is thinner:

1) it is less invasive when embedded within laminate composite structures or textiles

2) it requires less force to strain which makes it more suited for acoustic sensors and hydrophones

3) because it is more elastic in respect to its bending properties, it can be used in applications where small bend radii are required. The new fiber is currently offered for the 1550nm window and is drawn with an Ormocer coating resulting in an outer fiber diameter of 115µm.

Features

- Small fiber diameter of only 115µm
- Extremely high mechanical strength compared to conventional gratings (> 5% strain)
- Spliceless FBG chains with a high number of sensor elements
- Low bend loss fiber (high NA fiber)
- Operating temperature range: -180°C to +200°C
- ORMOCER® coating gives excellent adhesion properties with fiber glass, which means excellent strain transfer without coating removel
- The coating is uniform over the complete fiber length, even at the FBG position
- The automatic process means DTG®s can be produced in a very cost effective manner, especially for higher volumes

Fiber Bragg Gratings reinvented

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.

Standard Specification

Parameter	DTG-A2A3
Reflectivity (for grating length of 8 mm)	>15%
FWHM (for grating length of 8 mm)	100 pm
Centre wavelength (extended range upon request)	1510 to 1590 nm
Wavelength accuracy	< 0.5 nm
Relative wavelength accuracy	< 0.3 nm
Side Lobe Suppression (SLS)	10 dB (typical)
DTG® length	1 to 10 mm 8 mm typical
Attenuation	8.6 dB/km @ 1550 nm (typical)
Mode Field Diameter	6 µm @ 1550 nm
Cladding diameter[1]	80µm
Coating type[2,3]	ORMOCER®
Coated fiber diameter	115 µm (typical)
Tensile load at break	>20 N (corresponds to 5 % strain)
Temperature sensitivity[4] (formula: $\Delta\lambda/(\lambda \times \Delta T)$)	6.5 $K^{-1} \times 10^{-6}$
Strain sensitivity[5] (formula: $\Delta\lambda/(\lambda \times \Delta\varepsilon)$)	7.8 $\mu\varepsilon^{-1} \times 10^{-7}$
Operational temperature range[6]	-180°C … 200°C

1 Other diameters on request
2 (ORMOCER® : Trademark of Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.)
3 Other coatings possible on request
4 Measured between 0°C and 70°C
5 Measured at room temperature
6 Temperature range is dependent on exposure time

Ordering information

✔ Specify product-code: DTG-A2A3

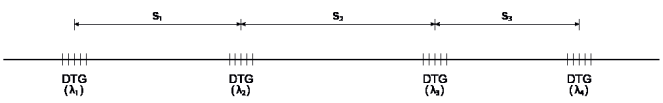
✔ Specify connector types

✔ Specify chain configuration

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

Configuration possibilities

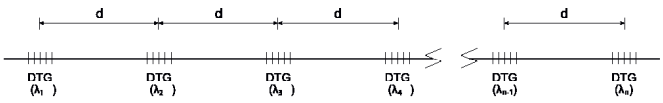
Long distance spacing:



Specification: $s_1, s_2, s_3, \ldots > 80$ cm

$\lambda_1 \leq \lambda_2 \leq \lambda_3 \leq \ldots$

Short and equidistant spacing:



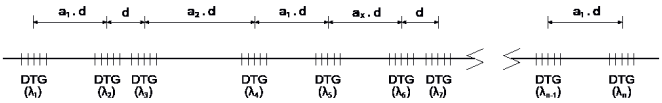
Specification:

length **d** shortest distance between successive DTG®s (10 mm ≤ **d** ≤ 300 mm)

$\lambda_1, \lambda_2, \ldots, \lambda_n$: wavelengths of the DTG®s, where $\lambda_2 - \lambda_1 = \lambda_3 - \lambda_2 = \ldots = \lambda_n - \lambda_{n-1} \geq 0$

guiding value for maximum wavelength difference: 2 nm per 1 cm distance

Short distance, flexible spacing:



Specification:

length **d** shortest distance between successive DTG®s (12 mm ≤ **d** ≤ 300 mm)

$a_1, a_2, \ldots, a_x$ is (integer) multiple of shortest distance **d**

$\lambda_1, \lambda_2, \ldots, \lambda_n$: wavelengths of the DTG®s, where $\lambda_1 < \lambda_2 < \ldots < \lambda_n$

guiding value for maximum wavelength difference: 1.6 nm per 1 cm distance

Special configurations of DTG®s upon request.

FBGS International NV reserves the right to make changes without further notice to any products. FBGS International NV February 2015 V5. All rights reserved.

FBGS International - Bell Telephonelaan 2H - B-2440 Geel
T: +32(0)14581191 - F: +32(0)14591514 - WWW.FBGS.COM - INFO@FBGS.COM