



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

The All Grating Fiber (AGF) is an optical fiber containing densely spaced low reflective ($R < 0.1\%$) Draw Tower Gratings (DTG[®]s). The spatial separation from center to center can be as small as 10mm and the FBG length can be chosen such that more than 95% of the fiber contains gratings. The fiber is designed to be used with an OFDR (optical frequency domain reflectometry) system that allows for fast and precise measurements over a wide strain or temperature range with spatial resolution down to a few mm over the entire fiber length.

The Low Bend Loss fiber LBL-1550-125 has a cladding diameter of 125 μ m and is optimized for operation in the 1550nm wavelength window. The glass composition has also been tuned such that the fiber maintains a good signal transmission under small bending diameters.

Features

- High density of DTG[®]s along the fiber length (fill factor up to 95%)
- Extremely high mechanical strength compared to conventional gratings (> 5% strain)
- 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°C to +200°C) using ORMOCER[®] coating
- 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

Parameter	Scan 90x
Reflectivity (for grating length of 8 mm)	<0.1%
Centre wavelength	1510 nm to 1590 nm
Absolute Wavelength accuracy ¹	≤ 0.5 nm
DTG [®] length	1 to 10 mm
Attenuation @1550nm	< 2.5 dB/km
Mode Field Diameter (MFD) @ 1550nm	7.8 μm (typical)
Numerical Aperture (NA)	0.14 (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 με ⁻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

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[®]

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Ordering Informations

V Specify product-code:

AGF	-	A3	XX	-	Y	Z
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XX = Coating type A4: ORMOCER[®]
 B4: One Layer Acrylate
 C4: ORMOCER[®]-T

Y=lead-in connector

Z=lead-out connector

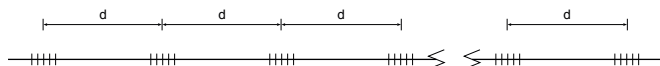
Y / Z	
A	FC/APC
B	LC/APC
C	SC/APC
D	E2000
E	spliced FC/APC
F	spliced LC/APC
G	spliced SC/APC
H	spliced E2000

V Specify wavelength:

- DTG wavelength
- DTG distance
- DTG reflectivity
- DTG length

Configuration possibilities

Short and equidistant spacing:



Specification:

length d shortest distance between successive DTG[®]s (d ≥ 10 mm)

λ1, λ2, ..., λn: wavelengths of the DTG[®]s, where λ1 = λ2 = ... = λn

Special wavelength configurations, such as random wavelength distribution, on request