

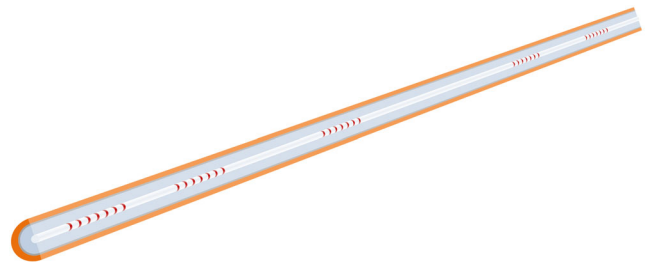
DATA SHEET

FS70PKF

Array of FBG in Peek Coating

SPECIAL FEATURES

- Optical fiber with several Fiber Bragg Gratings (FBG)
- Peek coated fiber for increased robustness
- Selectable wavelengths, cable lengths and connector types



DESCRIPTION

The Array of FBG in Peek Coating is a peek coated optical fiber with newLight® fiber Bragg gratings without connecting splices. The FS70PKF delivers the possibilities of a bare fiber with an added efficient layer for protection. The peek coated fiber Bragg gratings can be bonded to different surfaces and materials or mechanically attached to structures for multi-purpose measurements.

The newLight® technology was developed by HBK FiberSensing. newLight sensors employ high strength fiber coatings ensuring increased strain ranges, enhanced fatigue resistance and higher measurement

accuracy. HBK FiberSensing offers innovative sensor designs compatible with standard telecommunication fibers. This eases network design and significantly reduces installation time and cost, even when a large number of sensors are multiplexed on the same fiber, sometimes kilometers apart. The technology is completely passive - fitting explosive environments -, self-referenced - providing measurement long term stability - and compatible with most interrogators in the market.

BENEFITS AND APPLICATIONS

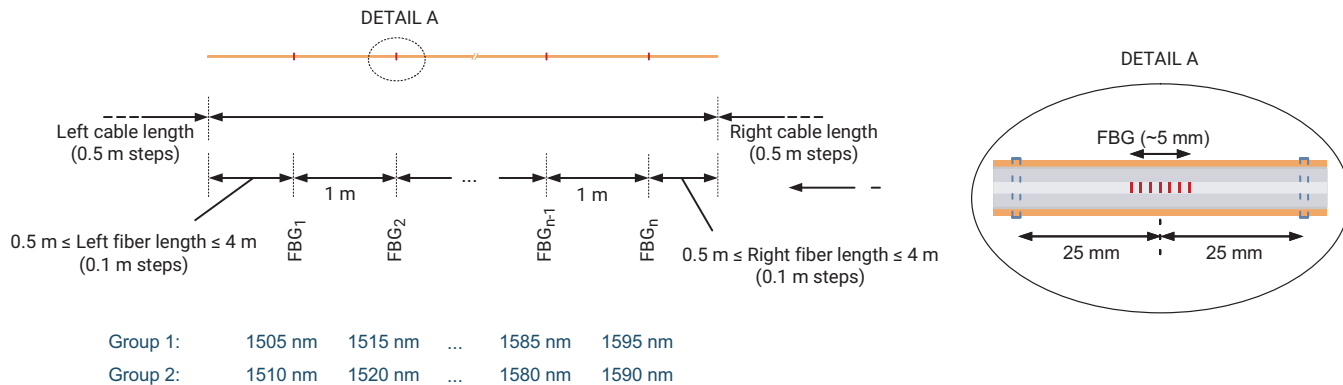
Sensor design

- Straightforward installation even in adverse environments
- Robust and resistant to most chemicals
- Suited for outdoor applications where small diameter and several measurements in a row are needed

Fiber Bragg grating technology

- No drift, absolute referenced measurements
- Immune to electro-magnetic and radio frequency interferences
- Passive technology fitting applications in explosive areas
- Reduced cable requirements with intrinsic multiplexing capability
- Long distances between sensors and the interrogators attainable
- Combinable with other FBG sensor types on the same fiber and same interrogator

DETAILS



SPECIFICATIONS

FBG		
k-factor	n.a.	0.78±0.01
Sensitivity ¹⁾	pm/(µm/m)	1.2
Resolution ²⁾	µm/m	0.5
Strain measurement range ³⁾	µm/m [%]	±7000 [0.7]
Bragg wavelengths	nm	1500 ... 1600 (±1)
FWHM, reflectivity and side lobe suppression	n.a.	≤ 0.3nm, 21±4%, > 10dB
Fiber type	n.a.	SMF-28 compatible
Fiber cladding and coating diameter	µm	125/195
PEEK coating diameter	µm	700
Maximum allowed power difference of FBG	dB	8
FBG length	mm	5±1
FBG spacing ⁴⁾	m	1±0.05
Fatigue ⁵⁾	cycles	10 ⁷
Operation and storage ⁶⁾ temperature ⁷⁾	°C	-40 ... 130; -20 ... 80
Operation and storage humidity	%	<95
Temperature cross sensitivity ⁸⁾	(µm/m)/°C	7.5±1
Attachment method	n.a.	Glue ⁹⁾
Bonding length	mm	>90 (centered at the FBG)
Bend radius	mm	>10
Main materials ¹⁰⁾	n.a.	Optical fiber, Ormocer®, Peek
Cables		
Type	n.a.	Ø1 mm braided (fiber glass, silicone varnish); Ø3mm aramid (Hytrel, Kevlar® and LSZH) or Ø3mm armor (Hytrel, stainless steel spiral, Kevlar®, stainless steel mesh and LDPE)
Cable fiber core, cladding and coating diameter	µm	9/125/250
Cable fiber coating	n.a.	Acrylate
Cable bend radius ¹¹⁾	mm	Braided or aramid >16; armor >30
Connecting splice	n.a.	Braided: Ø3x60mm (Polyolefin; vinyl acetate; glass fiber); other: Ø6x150mm for other cables (Polyolefin; vinyl acetate; Steel; Polyimide)
Max. cable length	m	Braided: 4±0.05; other: 20±0.05
Cable terminations	n.a.	FC/APC, SC/APC or No Connectors

Ordering information

Configurable Item				
K-FS70PKF				
Options				
Wavelength groups⁴⁾	1 – 10 FBG (1505 nm to 1595 nm @10 nm spacing) 2 – 9 FBG (1510 nm to 1590 nm @10 nm spacing)			
Cable type	BRD - Braided; ARD - Aramid; ARM - Armor; NON - No cable			
	Min. (m)	Max. (m)	Steps of (m)	Tolerance (m)
Connecting fiber	0.5	4	0.1	0.05
Connecting cable¹²⁾	0.5	Braided: 4; other: 20	0.5	0.05
Cable terminations	NC - No connector; FC - FC/APC; SC - SC/APC			

1) Typical. Considering an FBG with 1550 nm wavelength.

2) For 0.5 pm resolution in wavelength measurement, as found in FS22SI interrogator.

3) At room temperature, using X120 adhesive with a bonding length of 90 mm..

4) Distances between FBG are measured from center to center. For different distances or wavelengths please contact HBK FiberSensing. Customizations are only possible for high quantities.

5) Tested under a nominal strain of ± 1000 microstrain. Drift <10 microstrain.

6) Limited by the connectors.

7) Aramid cables start changing their mechanical characteristics above 70°C. Sensor behavior and measurement is not affected by this change.

8) Temperature Cross Sensitivity (TCS) is the thermal strain induced by a 1°C change in temperature.

9) HBK FiberSensing suggests the use of bi-component epoxies, as for example 3M DP490 cold curing adhesive.

10) The full composition of the sensor including cable, complies with RoHS, REACH, Conflict Minerals and fire propagation prevention directives.

11) Induced loss due to one complete turn around a mandrel lower than 0.05 dB..

12) If connecting cable option is selected. Lengths measured from the end of the cable or from the connector to the center of the splice that connects to the fiber. Total cable length (left and right) cannot exceed 20 m.

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