

- Robust FBG strain and/or temperature sensor
- Can be spot-welded to steel girders, pipes, hulls etc
- Zero power, EMI immune, intrinsically safe
- Multiple km signal integrity
- Suitable for long-term SHM applications
- All stainless hermetic welded construction available for aggressive environments
- Fatigue performance (6 million cycles at +/- 500 μ strain) verified at UKAS testhouse
- Developed for and approved by world-class engineering Company



SmartWeld spot welded to steel structure



SmartWeld undergoing calibration and fatigue testing at UKAS accredited testhouse

SmartWeld is an optical fibre strain/temperature sensor attached to a thin gauge stainless steel plate. This configuration allows the sensor to be spot welded directly to a steel structure ensuring long-term, creep-free strain transfer, without fear of bondline deterioration. This robust sensor is suitable for demanding environments including civil structures, ship hulls, offshore structures, pipelines, nuclear power plants, bridges and dams.

SmartWeld Specifications (typ):

	Unit	Standard	Options*
Plate dimensions	mm	15 x 40	
Gauge length (approx.)	mm	3	
Strain range	μ strain	+/- 2,500	> +/- 2,500
Strain sensitivity	pm/ μ strain	1.20	
Strain resolution [†]	μ strain	0.4	
Temperature range [‡]	$^{\circ}$ C	- 270 to + 150	> 150
Temperature sensitivity [‡]	pm/ $^{\circ}$ C	11	
Temperature resolution [†]	$^{\circ}$ C	0.05	
Fibre type		Single Mode SMF-28, 9/125 μ m	
Typical FBG type		CWL 1510 – 1590 nm, FWHM \sim 0.7 nm R > 70%, Apodised profile, SLSR > 15dB	Alternative CWL or spectral profile
Cable and connections		1.47 mm SS tubing emerging from sensor, transitioning to system cable and connectors to suit application	

[†] with 0.5 pm resolution interrogator

* custom SmartWeld available on request for volume applications

[‡] decreased temperature sensitivity below -170 $^{\circ}$ C, no temperature sensitivity below -220 $^{\circ}$ C

All specifications are correct at the time of writing and may change without notice.

Certain specifications may be speculative or untested - please contact us to confirm the specification meets with your requirements.

Example SmartWeld Installations:



Gas Pipeline



Container Ship