

NERVE composite DFOS sensors



NERVE

[nerve-sensors.com](http://nerve-sensors.com)

Our mission is to design, develop, produce and distribute innovative NERVE-SENSORS based on composite DFOS technology.

We provide products for Structural Health Monitoring (SHM) in the construction industry sector. We have invented the world's first composite DFOS sensors, which have already been applied in many proven industrial and R&D applications.

We support our partners at all stages of the process: idea, design, measurement and data analysis.

We deliver technology of the future, today.

**NERVE**  
nerve-sensors.com

# what are composite DFOS sensors?

Composite  
Distributed  
Fibre  
Optic  
Sensing

This breakthrough technology has created the ability to observe distribution of different phenomena over the entire length of the fibre, which can be hundreds of kilometers long.

# what are their applications?

- long-term structural health monitoring of engineering structures

---

- geotechnical and hydrotechnical engineering (i.e. slurry and retaining walls, piles, concrete columns, dams, embankments)

---

- line structures (roads, bridges, tunnels, railway lines, pipelines and others)

# Sense the difference

## Conventional sensing cables

slipping layers = distorted readouts  
(cannot give accurate measurements)

---

low measurement range  $\pm 1\%$   
(cannot measure large local strains caused by cracks and fractures)

---

unable to detect some phenomena  
(cannot be used as a reference tool in scientific surveys)

---

fragile & easy to yield  
(cannot be used as a substitute for steel reinforcement)

---

designed to remember events  
(cannot monitor actual state of the structure)

## NERVE composite DFOS sensors

no layers = reliable readouts  
(can give accurate measurements)

---

high measurement range  $\pm 4\%$   
(can measure large local strains caused by cracks and fractures)

---

sharp and accurate view of any phenomena  
(can be used as a reference tool in scientific surveys)

---

durable & heavy duty  
(can be used as a substitute for steel reinforcement)

---

designed for structural health monitoring  
(can assess the actual state of the structure)

# Perfect body

of the NERVE composite DFOS sensors

## fit and strong

- excellent representation of the monitored phenomena thanks to adequate stiffness and ribbed surface
- can replace steel reinforcement
- can cover very long distances

## monolithic structure

- sensor readings perfectly reflect the observed phenomena because there are no intermediate layers separating the fibre from the structure

## unique shape

- ensures perfect integration between the sensor and surrounding structure, which provides the highest quality of information

## 3D measurements

- accurate analysis assured by direct displacement (shape) measurement by the 3DSensor

## your desired size

- different sensor dimensions are available depending on project requirements

# Expanding family

of NERVE composite DFOS sensors



EpsilonRebar



EpsilonSensor



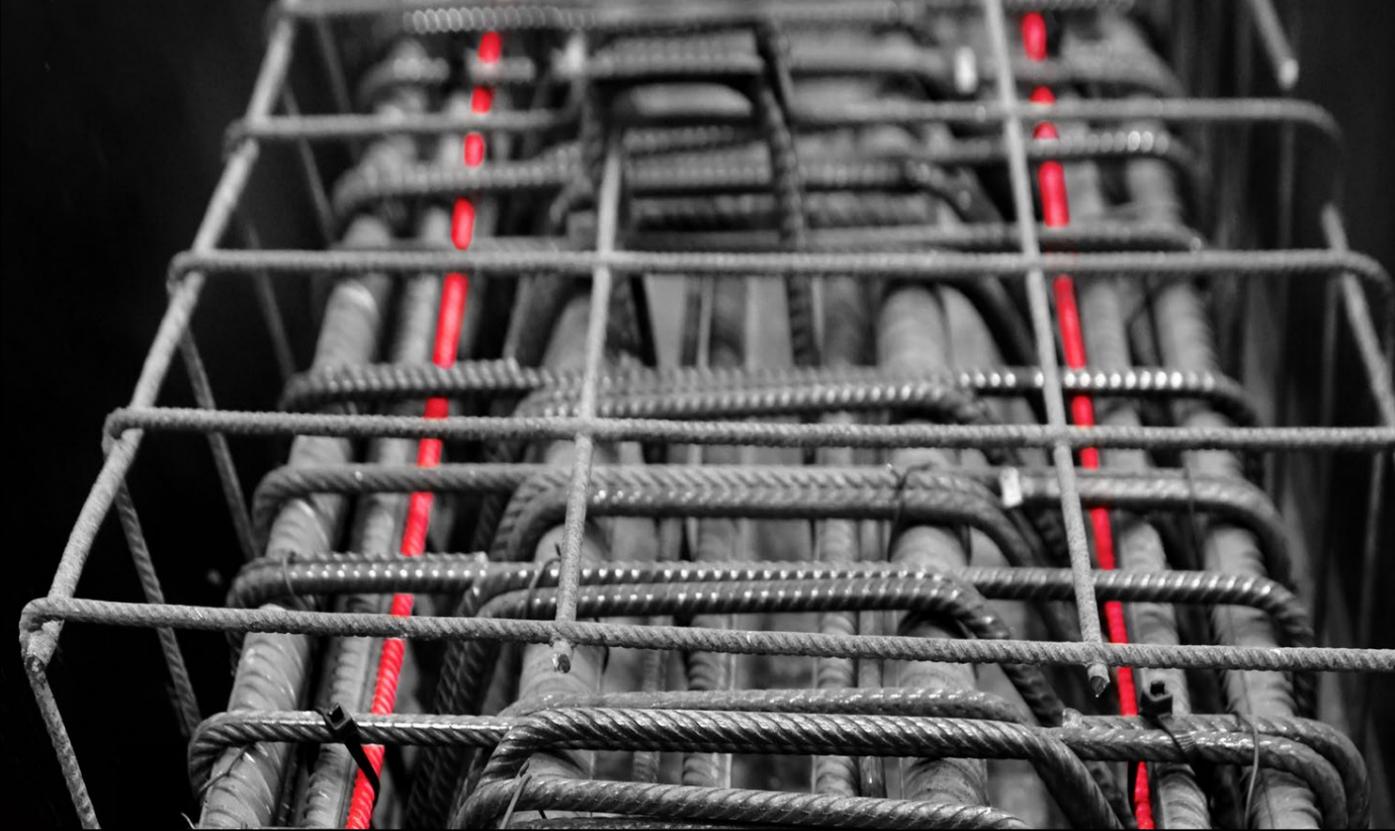
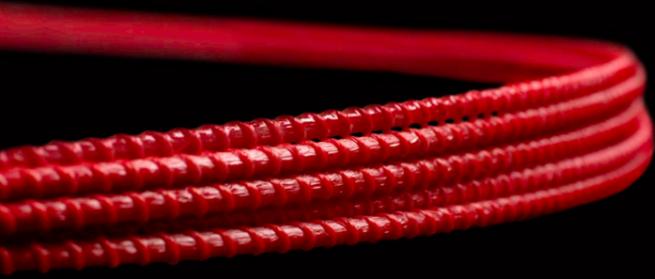
3DSensor

Common in the family:

- innovative technology that outrivals any other DFOS sensors on the market
- low sensor cost
- easy and fast installation
- high mechanical and chemical resistance
- resistance to electromagnetic interference
- unrivalled measuring range
- excellent integration with the monitored structure
- reliability and high precision
- compatible with any DFOS measuring technique (Rayleigh, Brillouin, Raman)

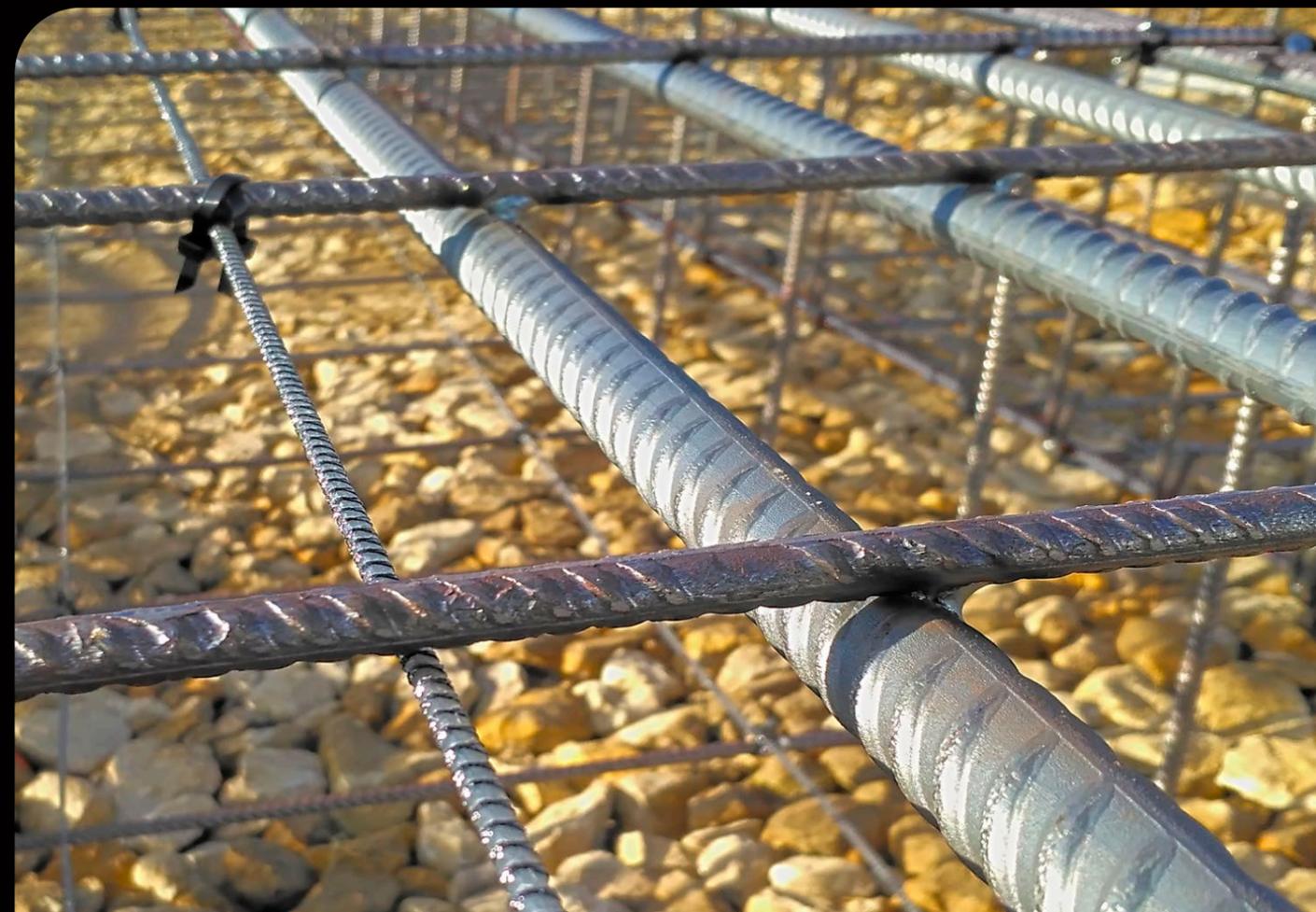
# EpsilonRebar

the world's first monolithic strain  
DFOS sensor designed for direct  
embedding into the structural  
member, concrete or soil.



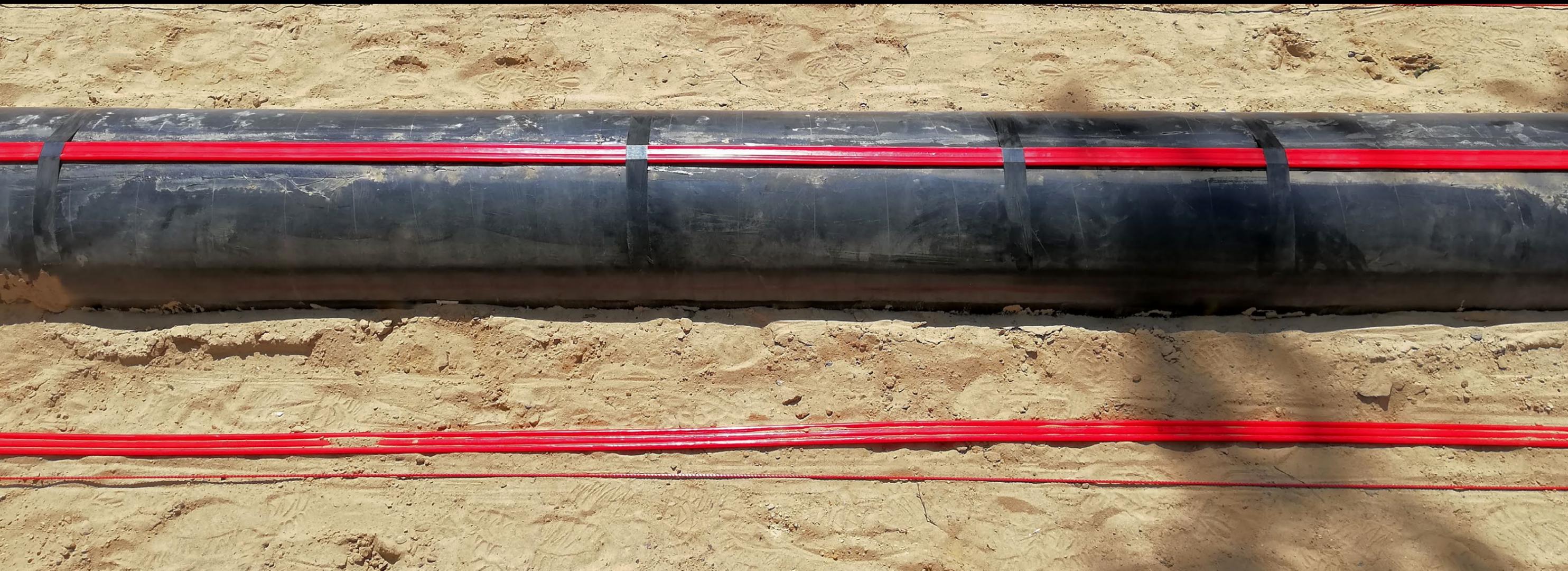
# EpsilonSensor

the world's first composite DFOS sensor  
with strain range up to 4% and elasticity  
( $E = 3 \text{ GPa}$ ) not influencing the structural  
behavior of monitored structure.



# 3DSensor

the world's first shape DFOS sensor for geotechnics and civil engineering, reflects displacements of the structure in 3D space along its entire length.





Long-term structural health monitoring of engineering structures



Geotechnical  
and hydrotechnical  
engineering



Line structures:  
roads, bridges,  
tunnels, railway  
lines, pipelines



# NERVE

[nerve-sensors.com](http://nerve-sensors.com)

[nerve-sensors.com](http://nerve-sensors.com)

[contact@nerve-sensors.com](mailto:contact@nerve-sensors.com)

+48 532 408 777