

The first Polish full composite bridge with DFOS-based monitoring system



ES & 3DSensor: Case Study

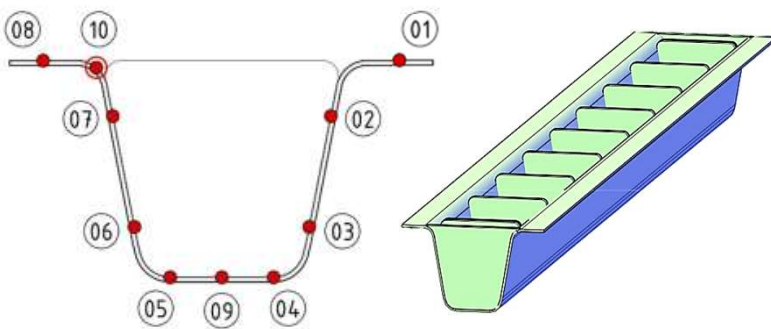
The innovative DFOS-based monitoring system was applied within the first Polish full composite bridge (composite girders + composite slabs). DFOS strain fibres were installed on the surface in the production hall, and then pre-prepared smart elements were delivered on-site. The system's design, including the appropriate arrangement of the fibres, allowed us to utilise the idea of both strain sensing with the **EpsilonSensor** and vertical displacement sensing with the **3DSensor**.



Benefits of application

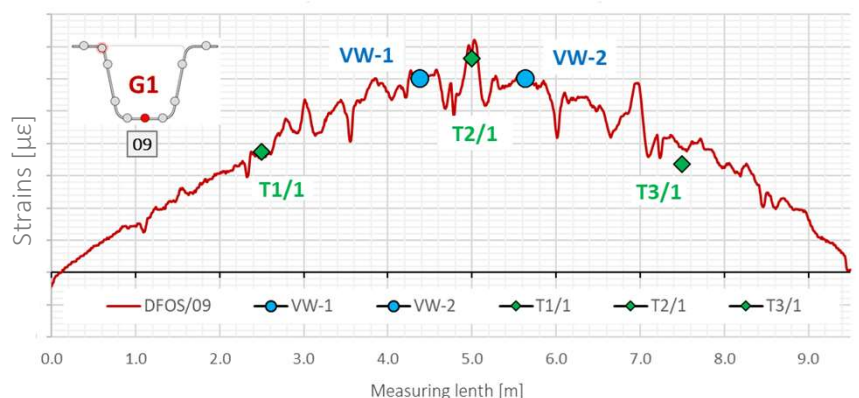
- **Prefabrication of the smart structural element** in the production hall
- Reliable data for **structural assessment** from a **real zero strain/stress state**
- Simultaneous measurements of **strains and displacements (shape changes)**
- **Thousands of measurements points** within a single element for self-diagnostics

Example results



The DFOS-based monitoring system was used to verify the bridge's structural performance during its load tests and during long-term monitoring. Thanks to the negligible costs of the DFOS fibres, there was no need to limit the number of measurement sections. The figure below summarises example strain results obtained during the load tests, confirming very good compliance with other reference and spot techniques.

- 🎯 **50 000** measurement points
- 📏 **100 m** of sensing path
- NERVE **10 x** DFOS strain sensors
- 🕒 **load tests & long-term**



project
partner:

