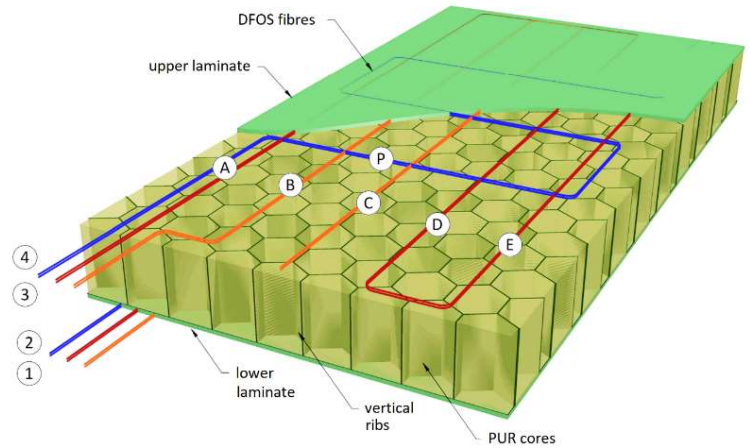


Smart composite FRP panel for bridge engineering



Nerve-Sensors: Case Study

In this unique project, it was possible to create a smart element capable of self-diagnosis. **Nerve-Sensors**, including full integration of optical fibre with composite core, as well as displacement (shape) calculation, was implemented in a single bridge panel dedicated for smart bridge engineering. Many laboratory tests with both strain and displacement measurements were performed under the control of independent reference techniques.



Benefits of application

- **Full integration** of the sensors with the panel at the production (infusion) stage
- 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

Example measurement results obtained directly from the smart structural component are presented in the plots. We can observe both strains and displacements (shape changes) over length compared to reference techniques. It proves very good accuracy and high-quality performance of this measurement solution, which are the basis for the Nerve-Sensors idea.

 **12 000** measurement points

 **60 m** of sensing path

 **16 x** DFOS strain sensors

 **short-term (laboratory)**

 project partner:  RZESZOW UNIVERSITY OF TECHNOLOGY

