

# Strains measurements in asphalt layers during dynamic truck runs

## EpsilonRebar: Case Study

This experimental project involved a road structure equipped with **EpsilonRebars** for strain measurements. Our sensors provided the unique possibility of analysing the internal behaviour of asphalt layers under dynamic truck's runs. The measurements were done in real-time with extremely high spatial resolution and extreme accuracy. This was due to the high elastic composite core, monolithic design and perfect bonding of the sensors with surrounding asphalt.



## Benefits of application

- Measurements of internal **strains** inside the asphalt layer with a great accuracy
- Observation of **structural response in real-time** during truck's runs
- Possibility of **calibrating** numerical models, including **dynamic effects**
- Detailed **scientific data** for new road structure design procedures (optimisation)

## Example results



Our DFOS-based nervous system with **EpsilonRebars** embedded into the asphalt was used for measurements during truck runs. Sensors could withstand harsh installation conditions, including high temperatures during asphaltting. Perfect strain transfer, characteristic of the monolithic design, was clearly visible in the obtained results. For example, we indicated the differences in structural response caused by the action of the front (single wheels) and rear (dual wheels) axles.

 **100 770** measurement points

 **131 m** of sensing path

 **13 x** EpsilonRebar

 **short-term (load tests)**

 project partner:



**Silesian University  
of Technology**

