Monolithic vs. layered - the first such comparison in RC structures

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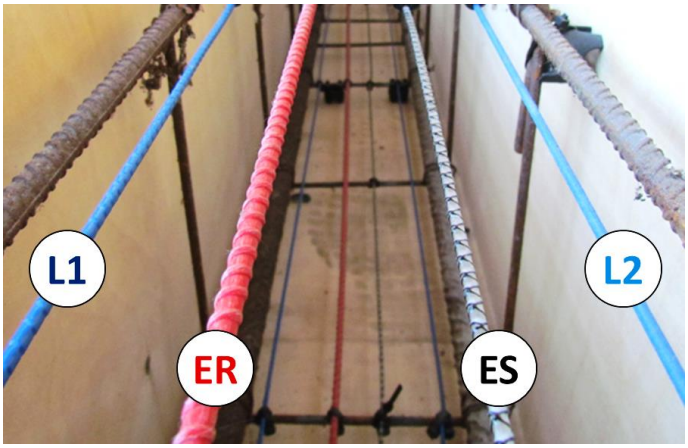
ES & ER: Case Study

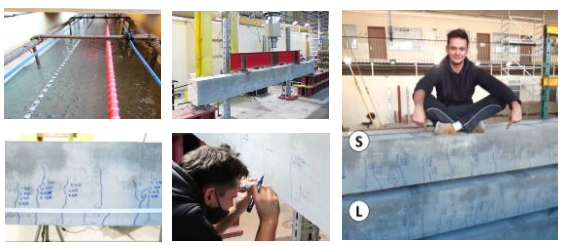
The research in question was one of the first of its kind in the world, where conventional layered cables were compared directly with monolithic and composite sensors (**EpsilonSensors and Epsilon-Rebars).** DFOS tools were installed within six 4 m long reinforced concrete beams, both in compression and tension zone. The impressive results proved the high-quality performance of monolithic sensors, especially in local damage detection, and were used to prepare a PhD thesis.



Benefits of application

- **Full knowledge of crack morphology** during the entire research (all load steps)
- No risk of sensor breakage **during the extreme crack-induced strains**
- Analysis of **crack widths** thanks to the correct strain transfer (no slippage)
- **Reliable data** for the safety assessment of reinforced-concrete structures

Example results



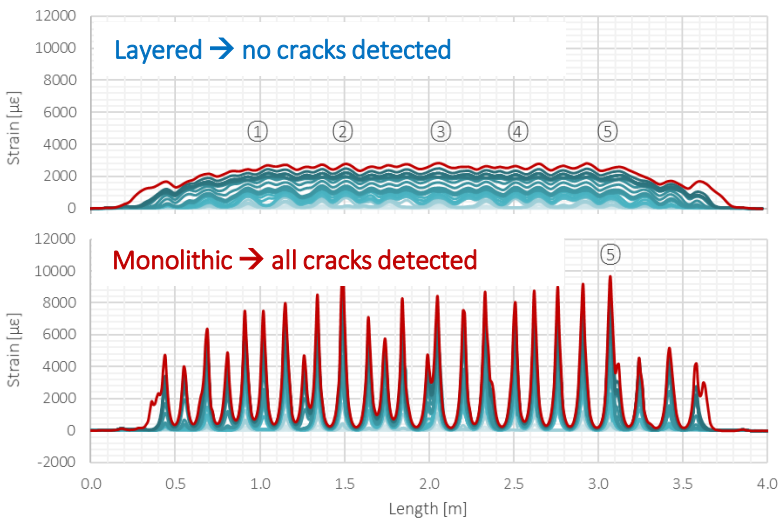
DFOS tools with different internal designs (multiple layers or monolithic cross-sections) and materials (plastic & steel or composite) were used to detect cracks in RC beams. The results clearly show the high-quality performance of monolithic sensors and their advantage over conventional cables, which create the risk of not seeing cracks! This is not acceptable from the safety assessment point of view.

19 200 measurement points

192 m of sensing path

12 x ES, **12 x** ER

short-term **(laboratory)**



Project **partner**:

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