



Nerve-Sensors

sense the difference





AKADEMIA
GÓRNICZO-HUTNICZA
IM. STANISŁAWA STASZICA
ROK ZAŁOŻENIA 1913



Wydział Inżynierii Górniczej
& Hutniczanej



POLITECHNIKA KRAKOWSKA

Wydział Automatyki i Robotyki

Wydział Inżynierii Mechanicznej i Inżynierii Materiałowej

Wydział Inżynierii Elektrycznej i Elektroniki

Wydział Inżynierii Informatycznej i Telekomunikacji

Wydział Inżynierii i Techniki

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*10th anniversary
2022*



*Tadeusz Kościuszko
Mound in Kraków - 2012*

since 2014

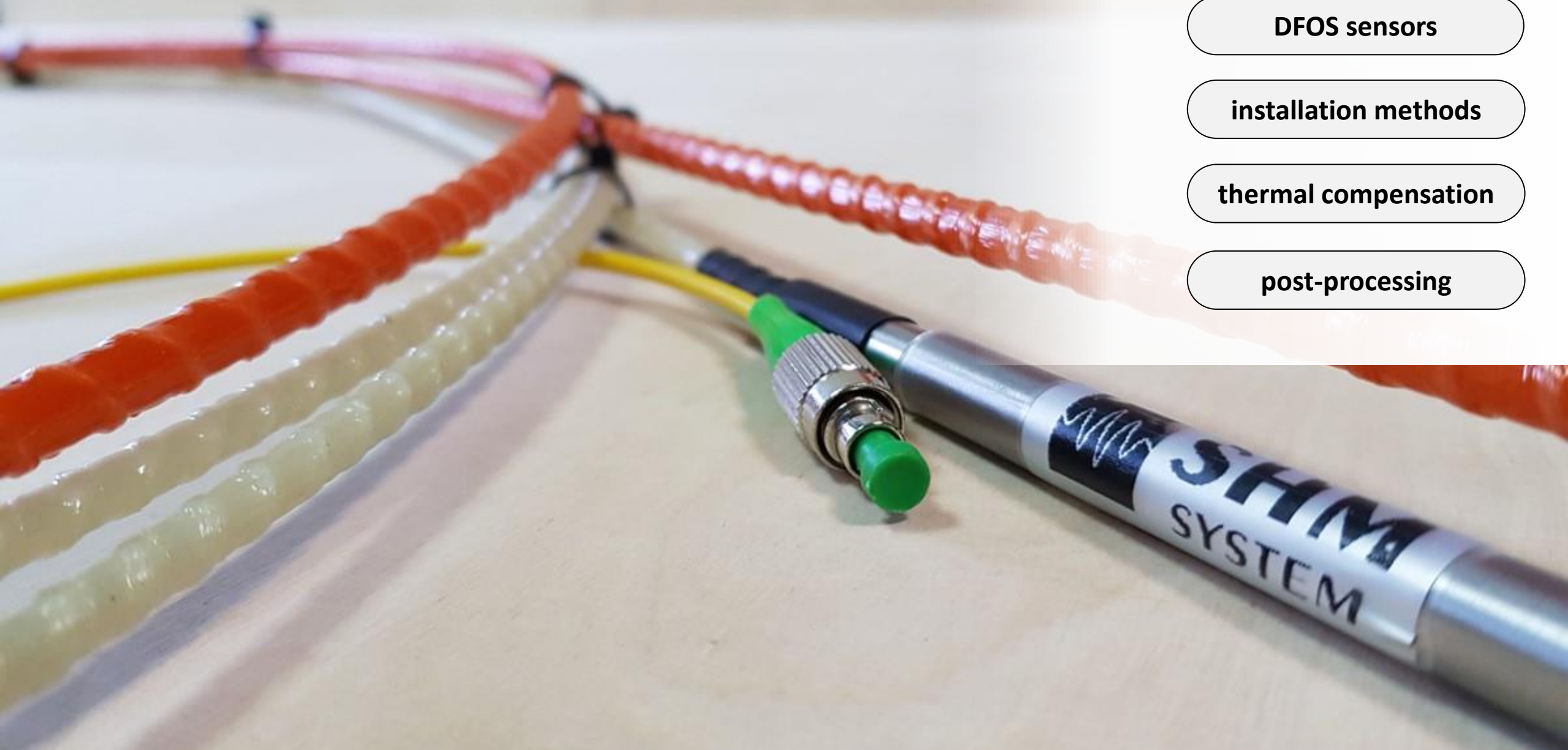
interrogators

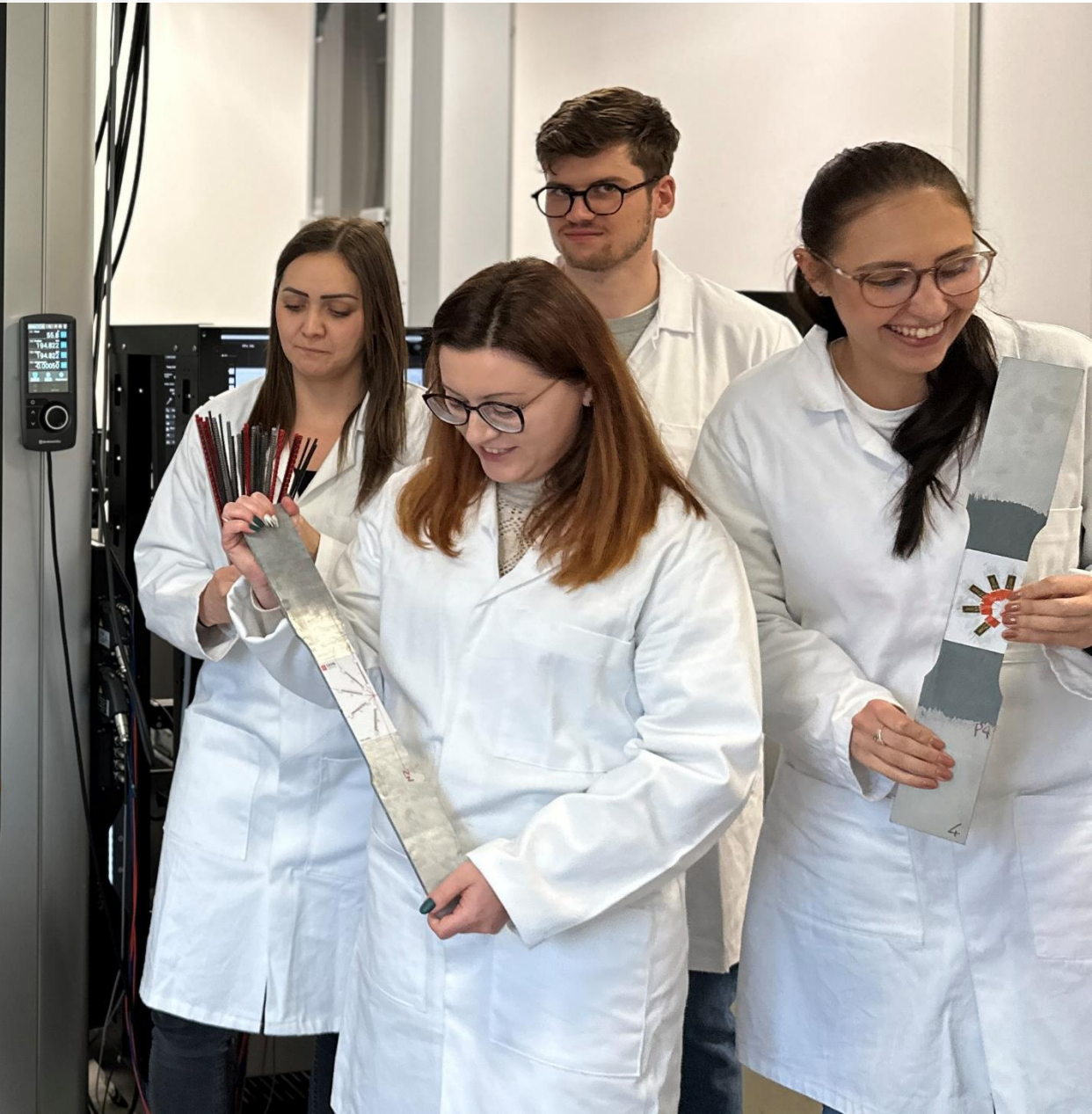
DFOS sensors

installation methods

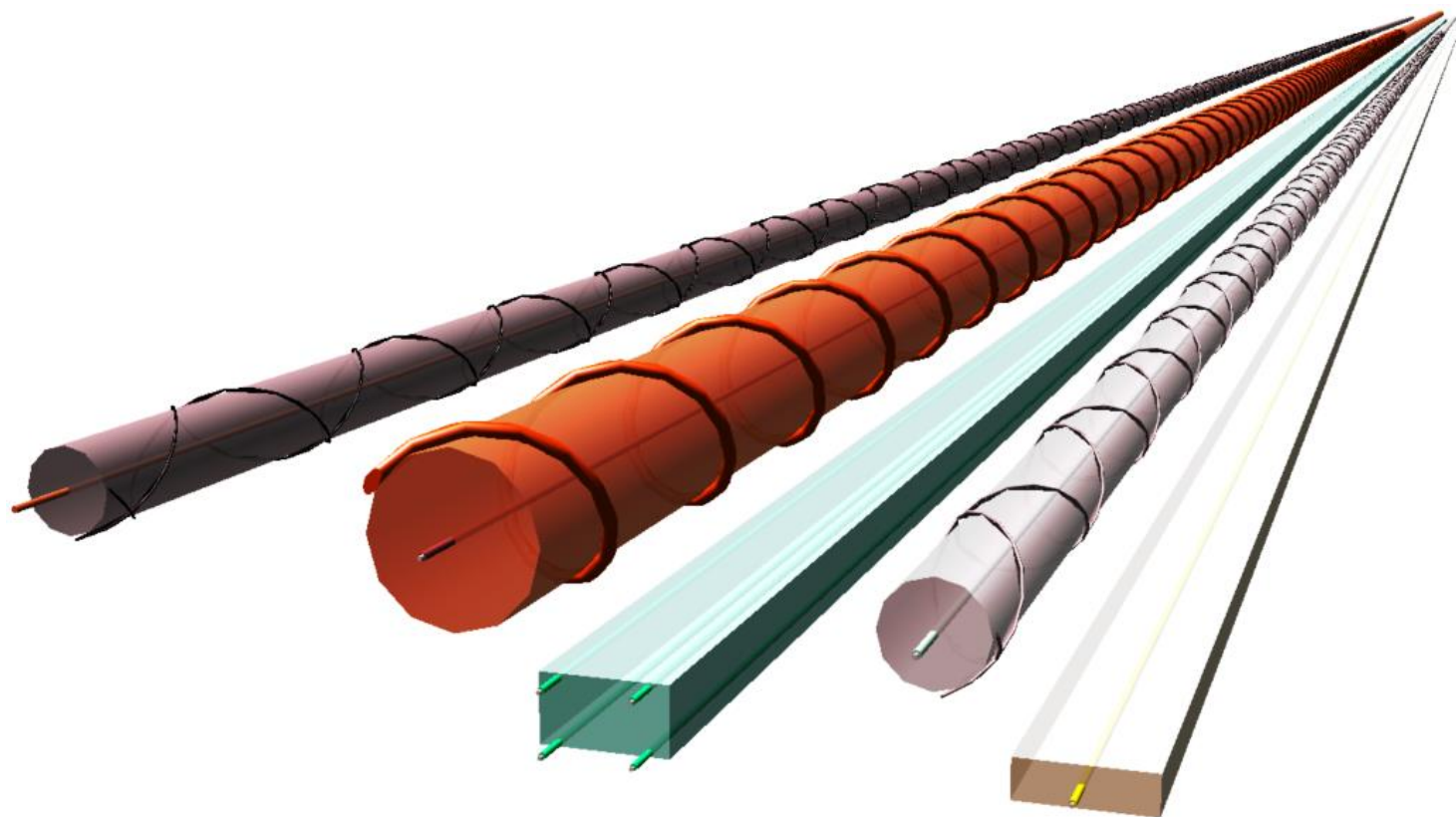
thermal compensation

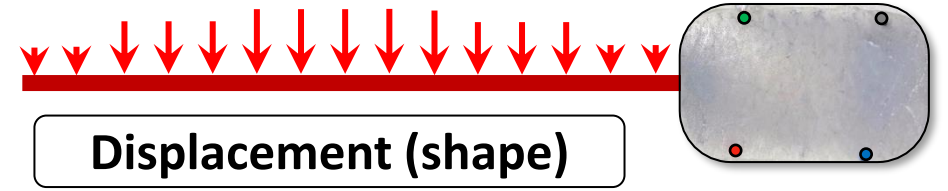
post-processing











EpsilonRebar

E = 50 GPa, ±2%, Ø5 mm



EpsilonSensor

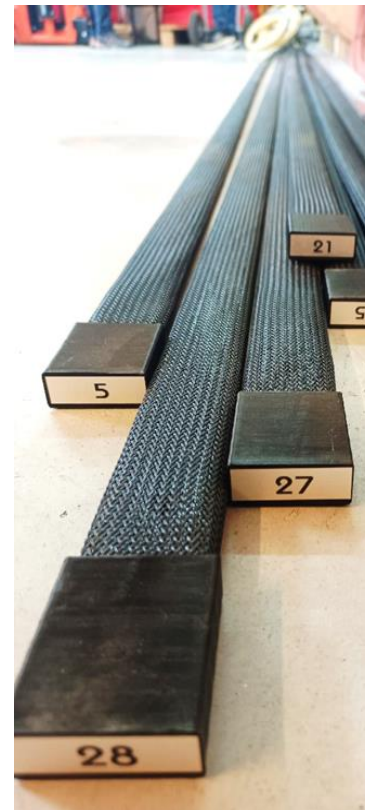
E = 3 GPa, ±4%, Ø3 mm



EpsilonGraph

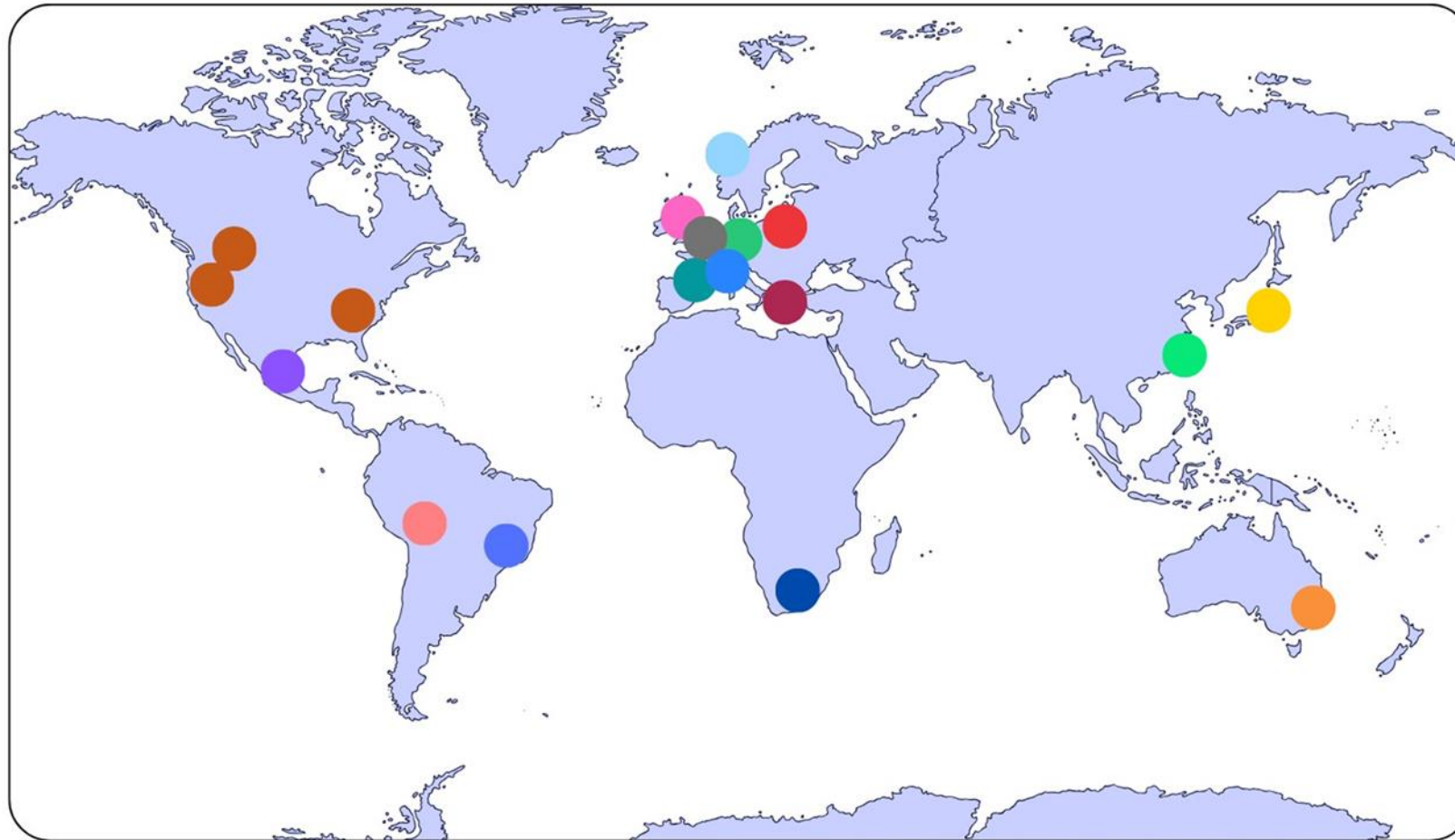


EpsilonFlat



3DSensor

Patented (EU, US, CAN)



- Poland
- USA
- Australia
- Japan
- Mexico
- Bolivia
- Brazil
- Taiwan
- United Kingdom
- Germany
- Norway
- Netherlands
- France
- Greece
- RPA

Construction companies



Technical universities



Institut für Massivbau
Univ.-Prof. Dr.-Ing. Steffen Marx



KAJIMA
Technical Research Institute



Cracow University
of Technology



GDANSK UNIVERSITY
OF TECHNOLOGY



Silesian
University
of Technology



Wrocław
University
of Science
and Technology



AGH



POZNAN UNIVERSITY OF TECHNOLOGY

Warsaw University
of Technology



Politechnika Świętokrzyska
Kielce University of Technology



RZESZOW UNIVERSITY
OF TECHNOLOGY



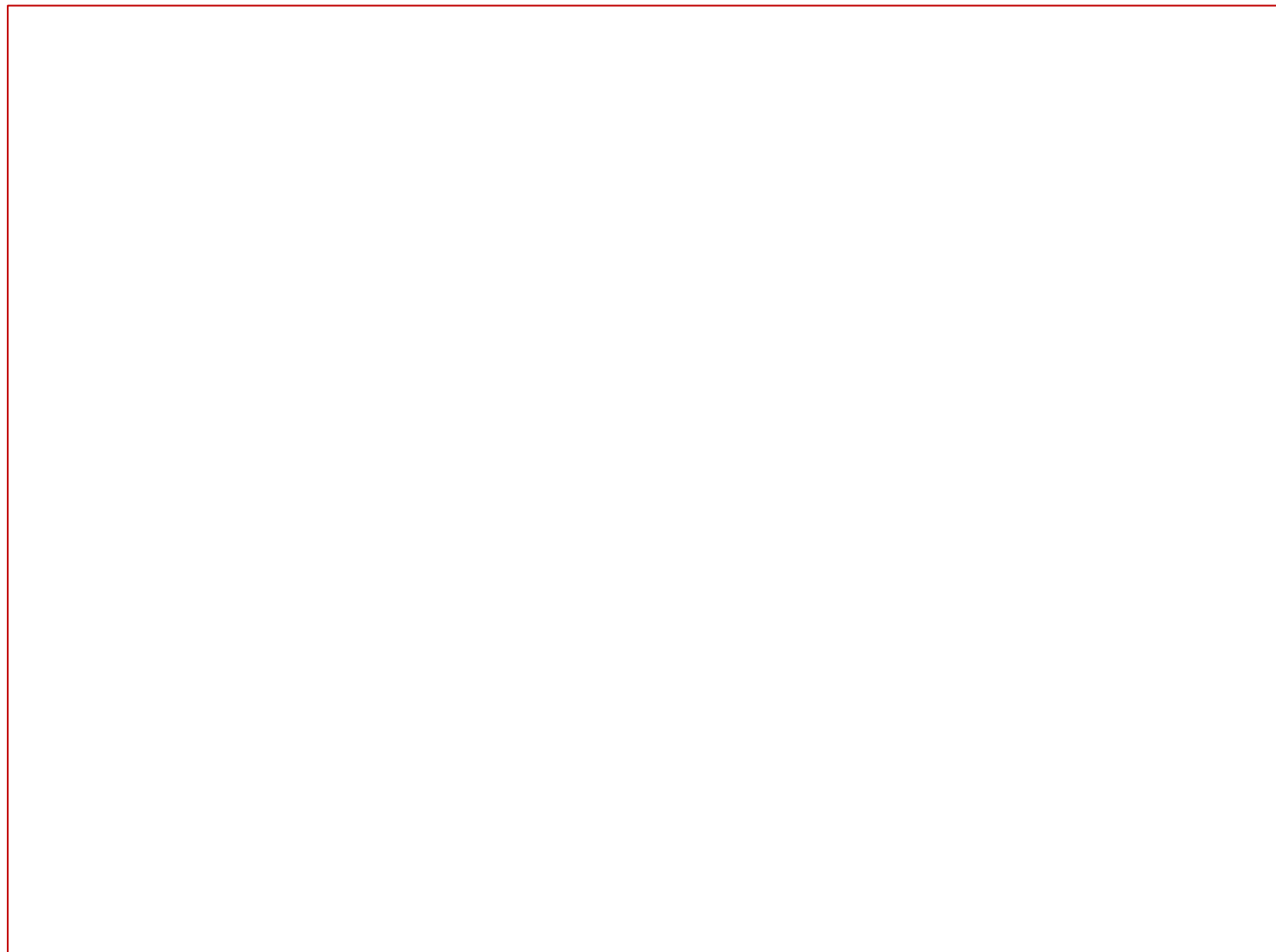
JAGIELLONIAN UNIVERSITY
IN KRAKÓW

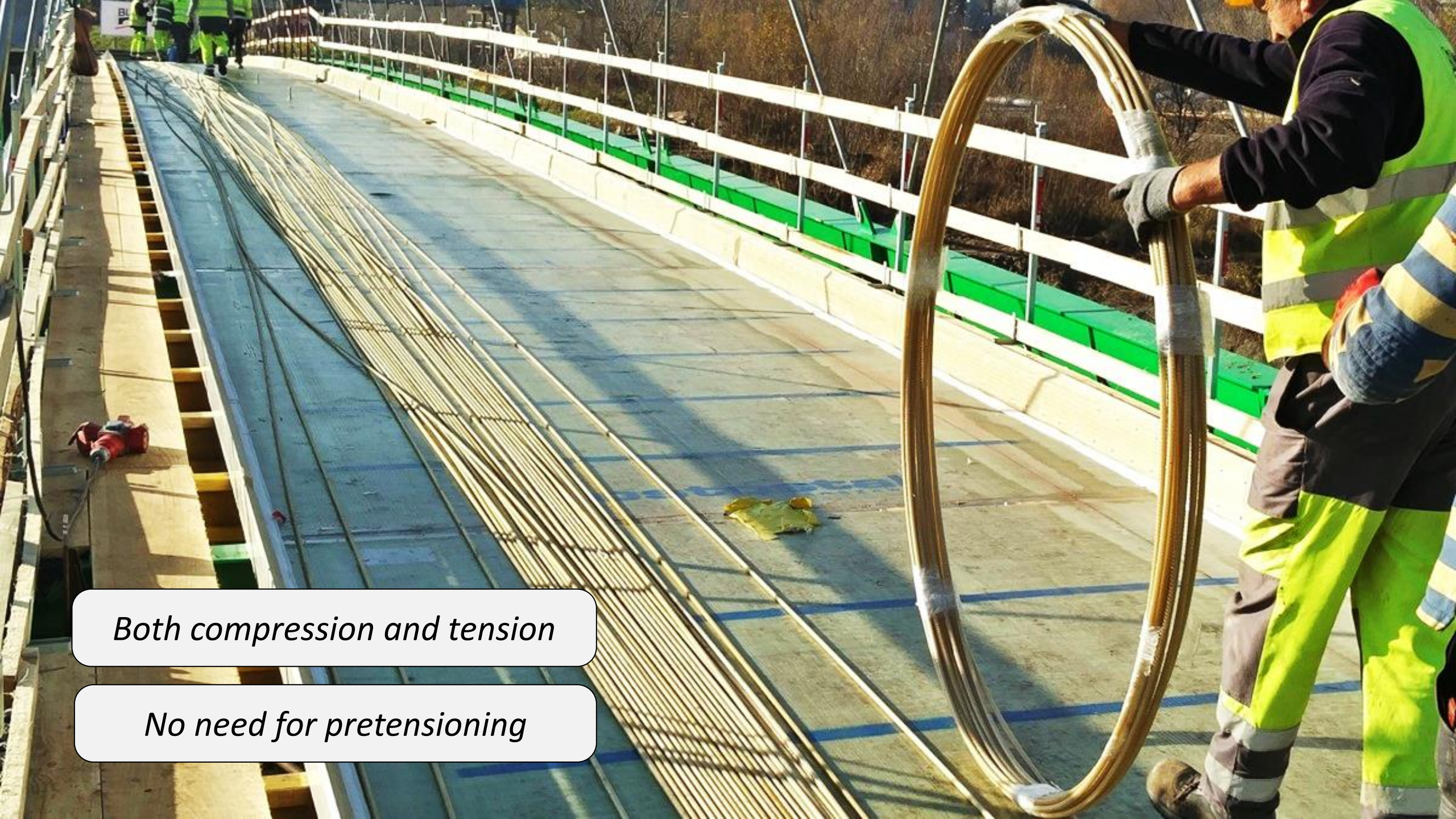
Examples











Both compression and tension

No need for pretensioning



- 1) „zero”
- 2) *adhesion*
- 3) *protection*
- 4) *temperature*
- 5) *esthetics*

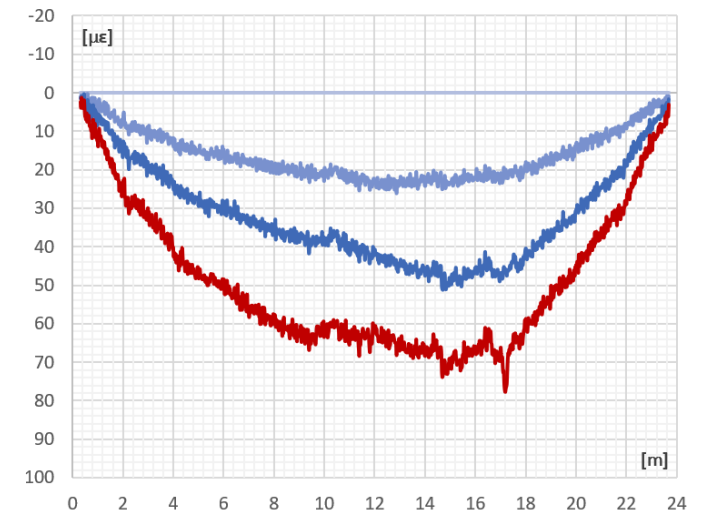
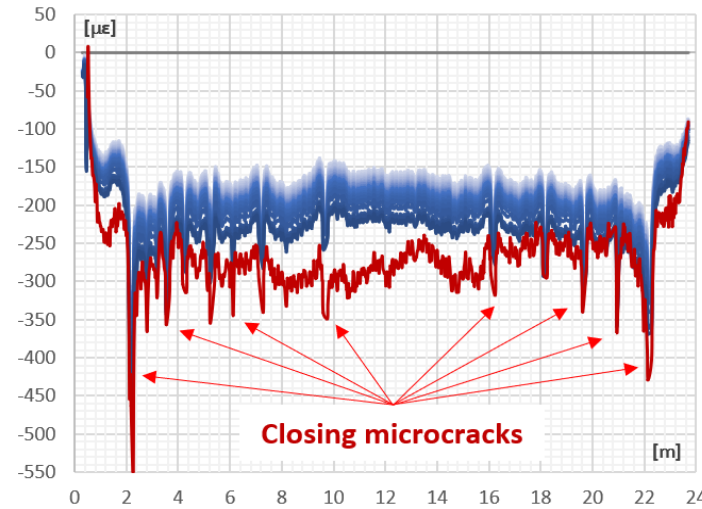
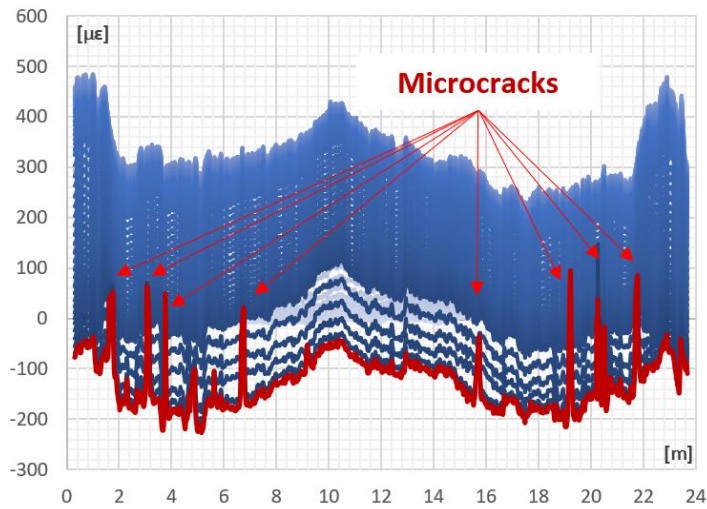
Early-age concrete



Prestressing + installation



Mechanical load tests

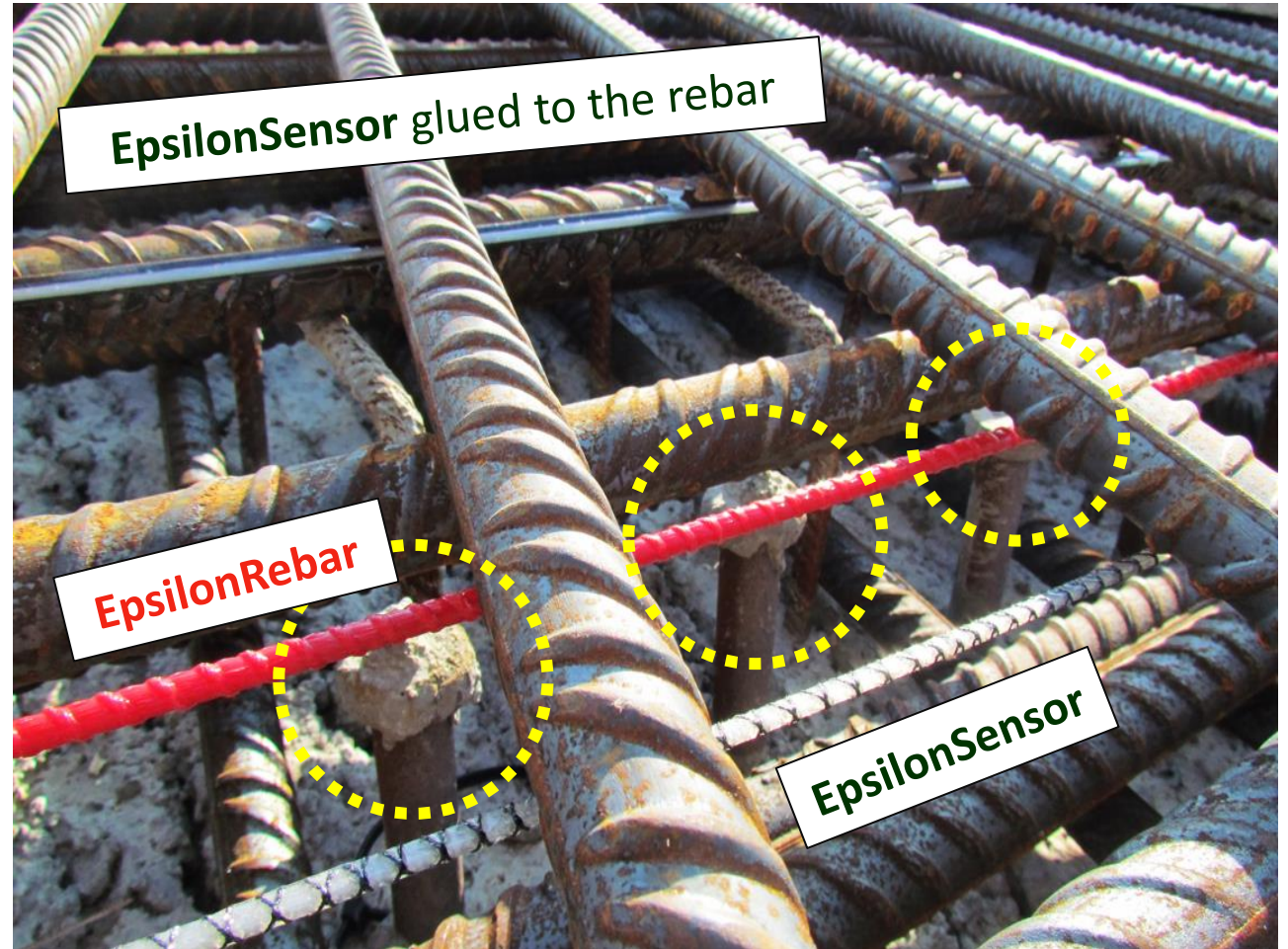




COMBISAFE

COMBISAFE

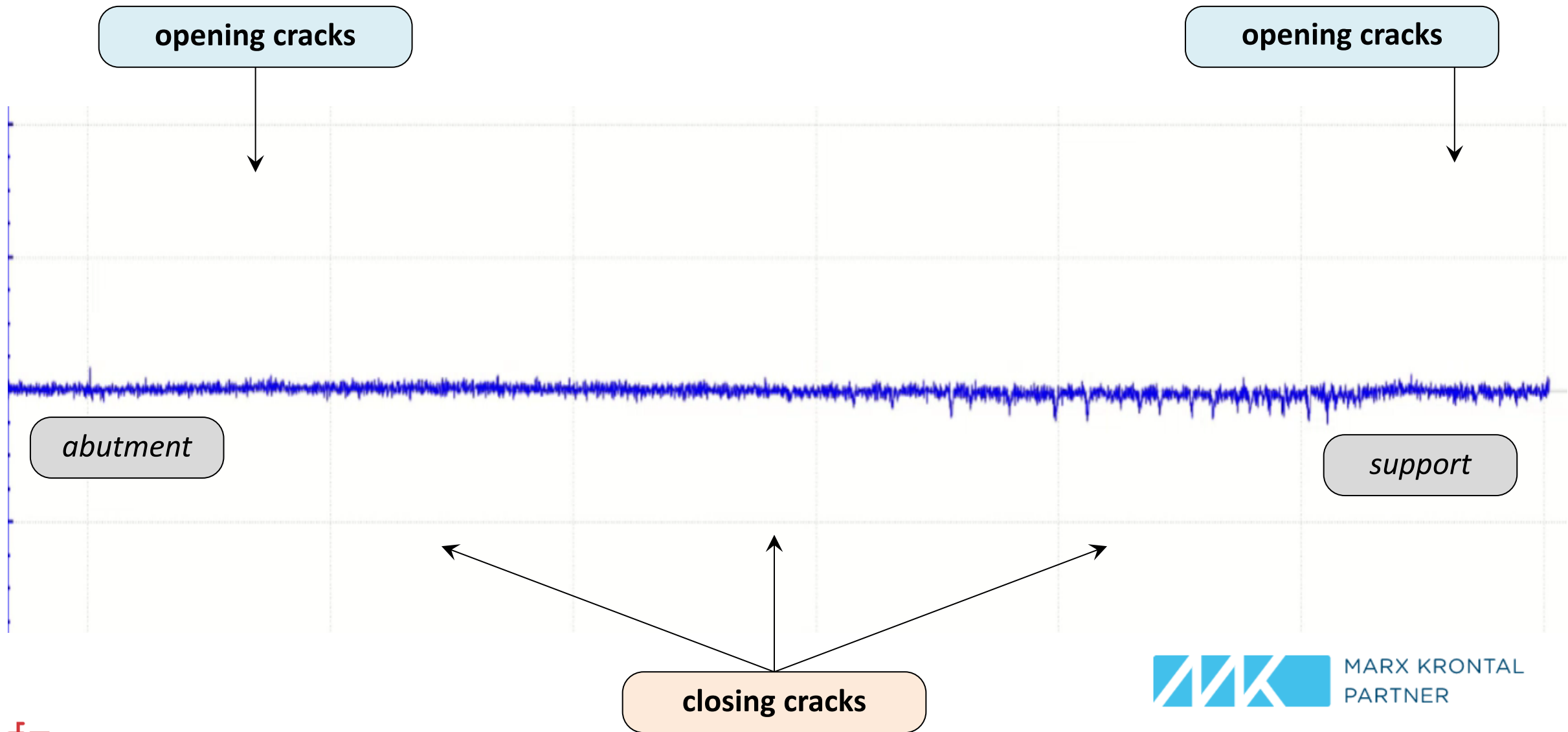
COMBISAFE



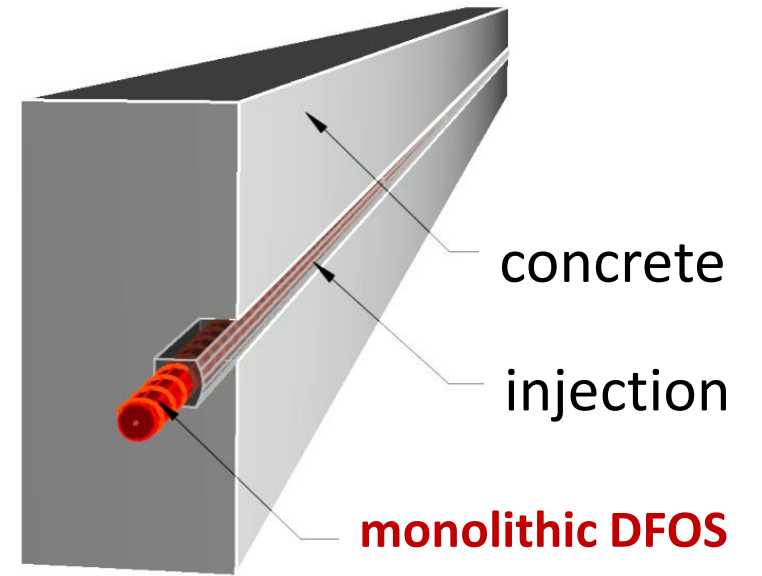
project partner:

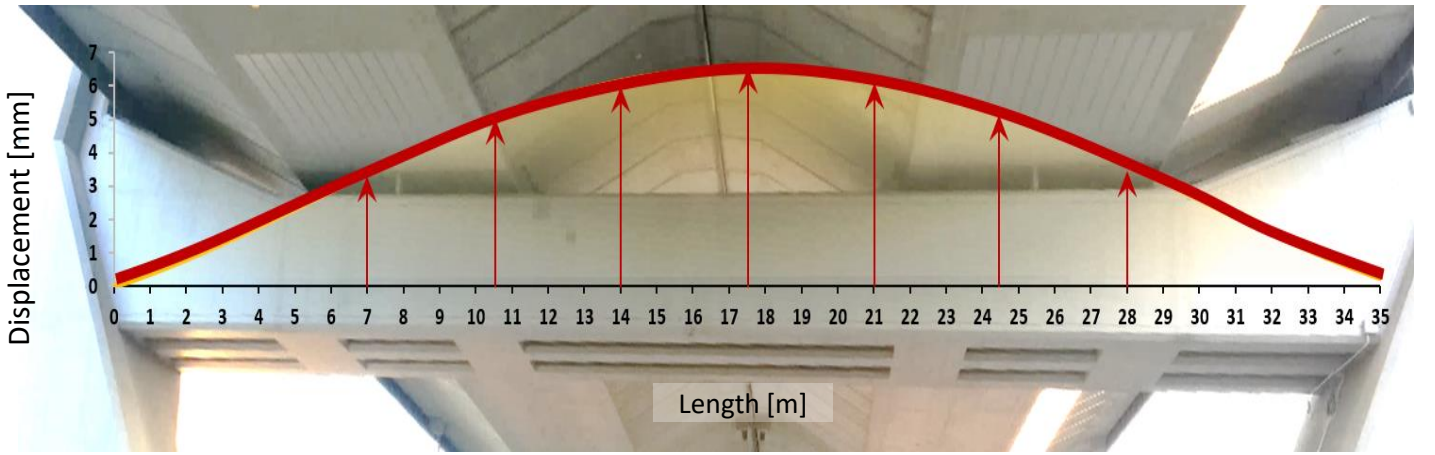
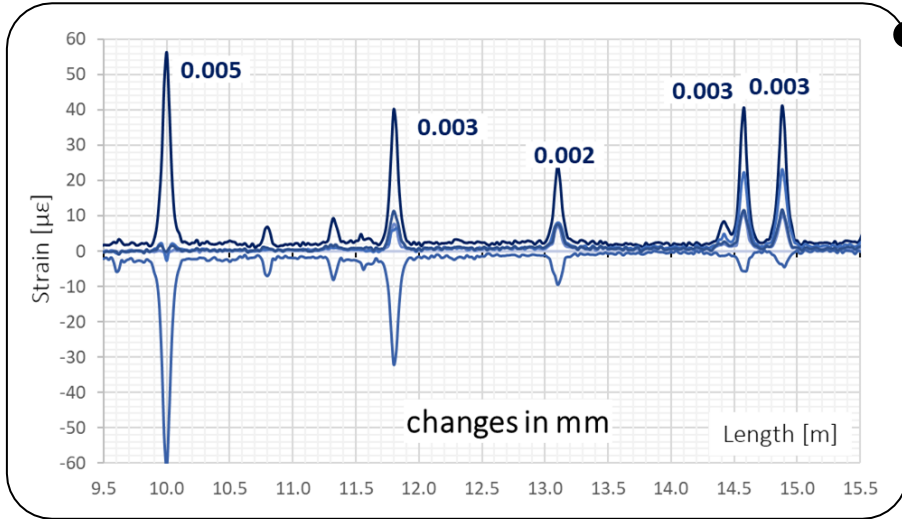
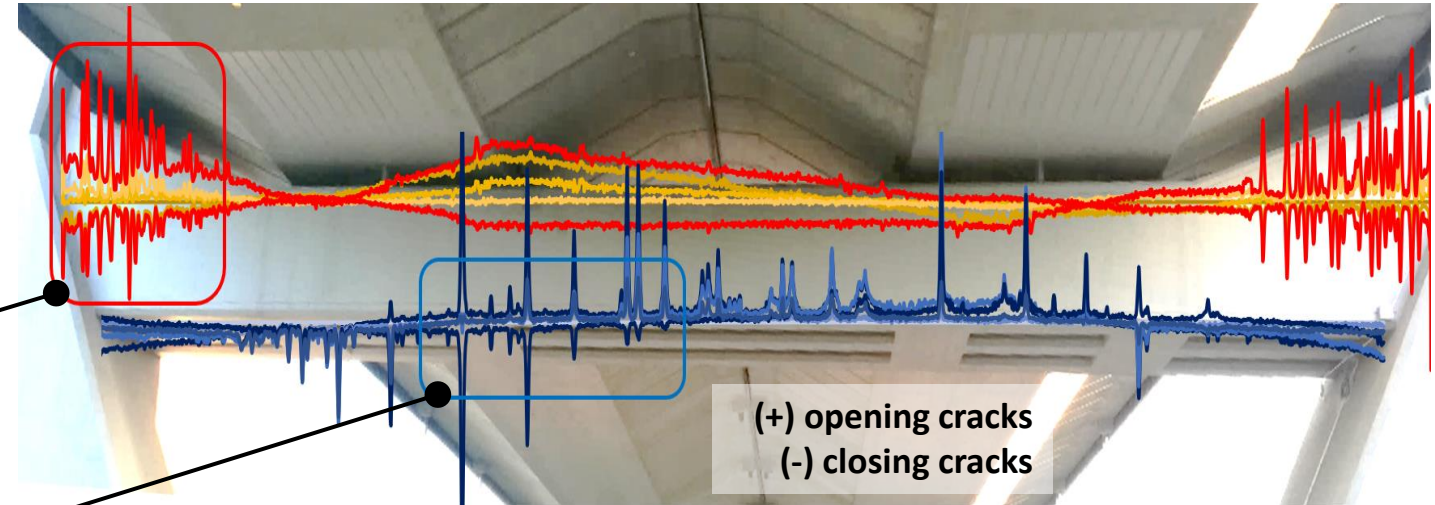
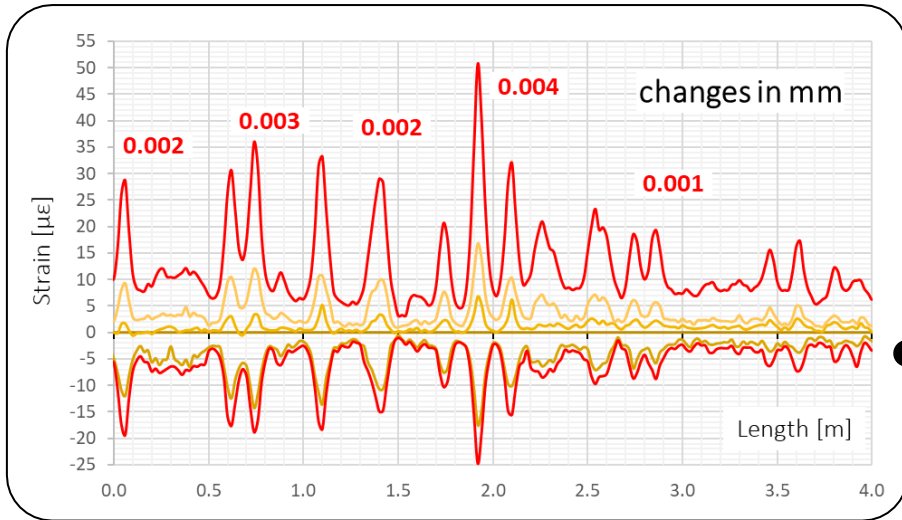


MARX KRONAL
PARTNER









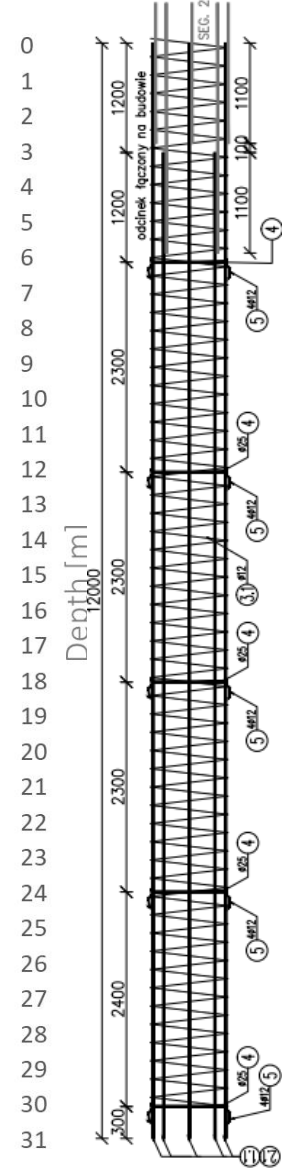
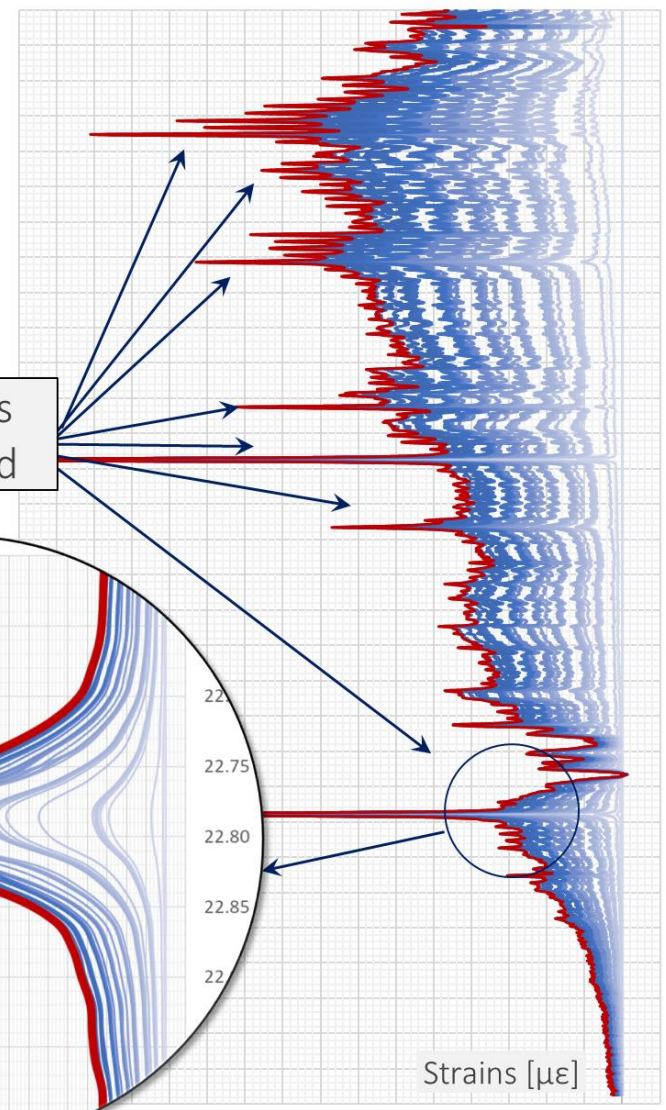
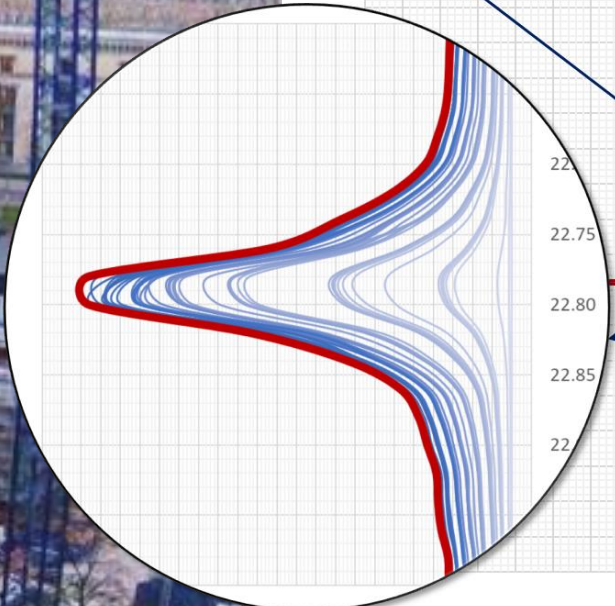






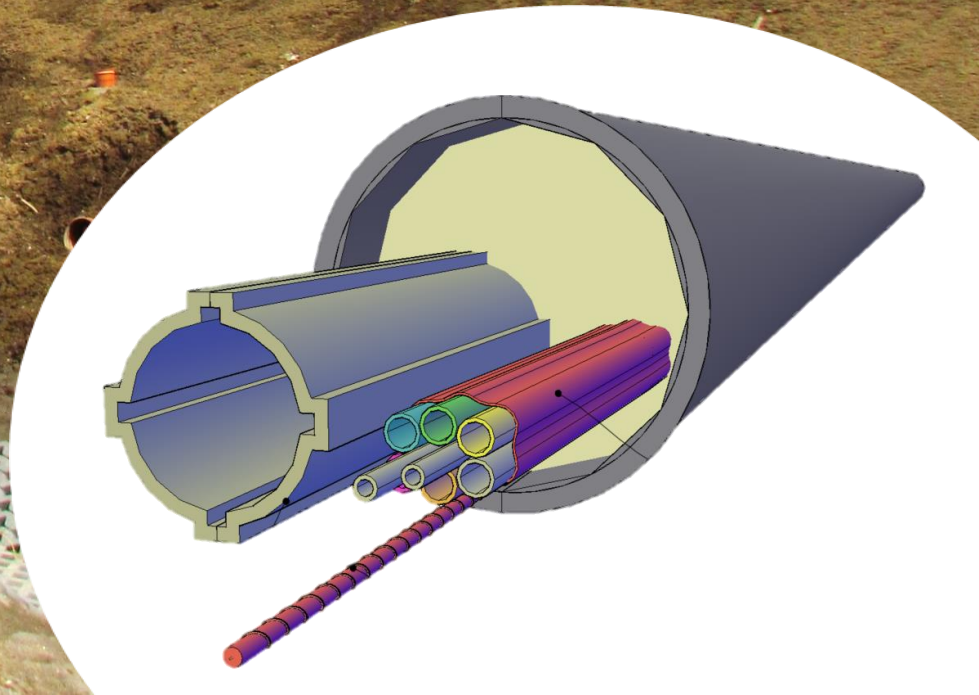


Local cracks
being closed



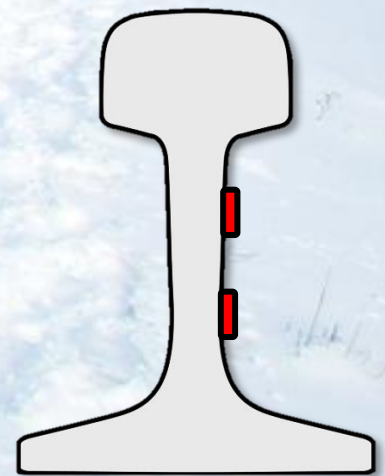




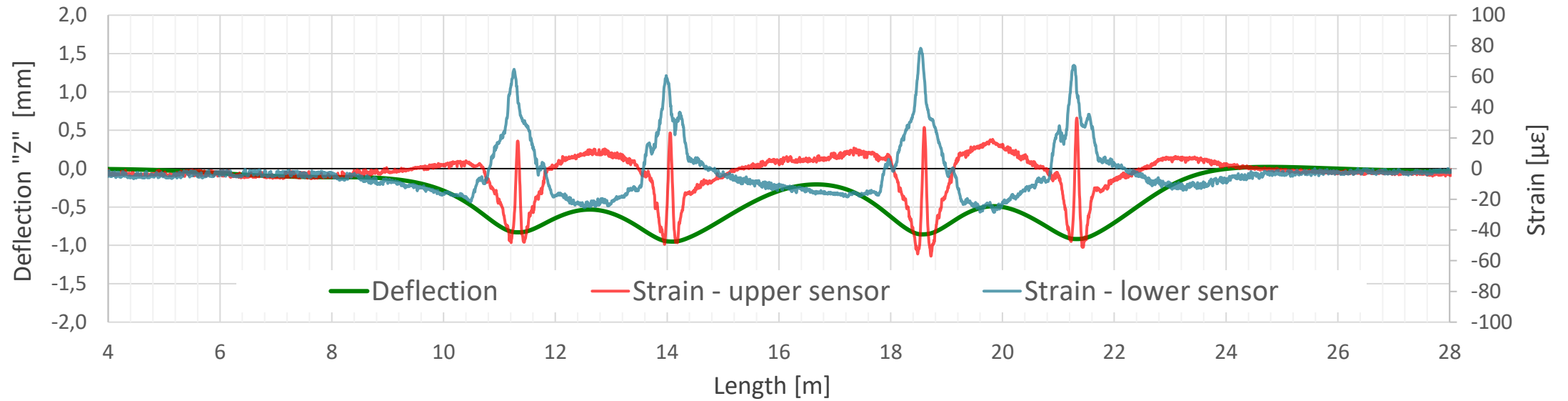








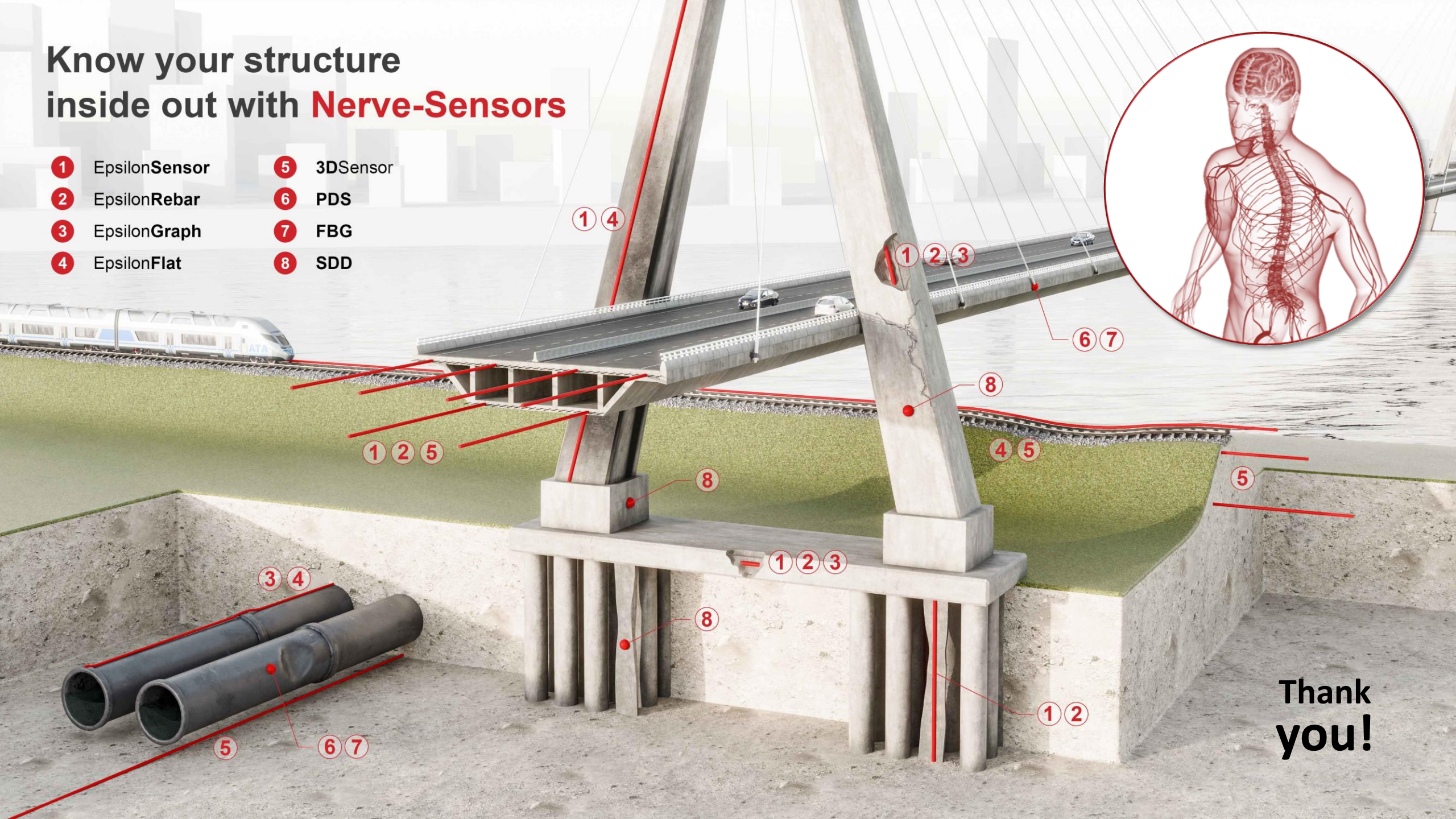




Summary

Know your structure inside out with **Nerve-Sensors**

- 1 EpsilonSensor
- 2 EpsilonRebar
- 3 EpsilonGraph
- 4 EpsilonFlat
- 5 3DSensor
- 6 PDS
- 7 FBG
- 8 SDD



Thank
you!



- Germany
- EpsilonFlat
- 4 x 700 m = 2800 m
- automatic 24/7
- custom installation (trolley)
- Brillouin-based
- pilot application for 6 months
- reference total station
- strain & temperature & displacements



E.C.O. Group

FOLAB

