



**International cooperation between the Czech Republic and its partners
within EUREKA and Eurostars programme**

SVÚM a.s. successful EUREKA projects with partners from the United Kingdom

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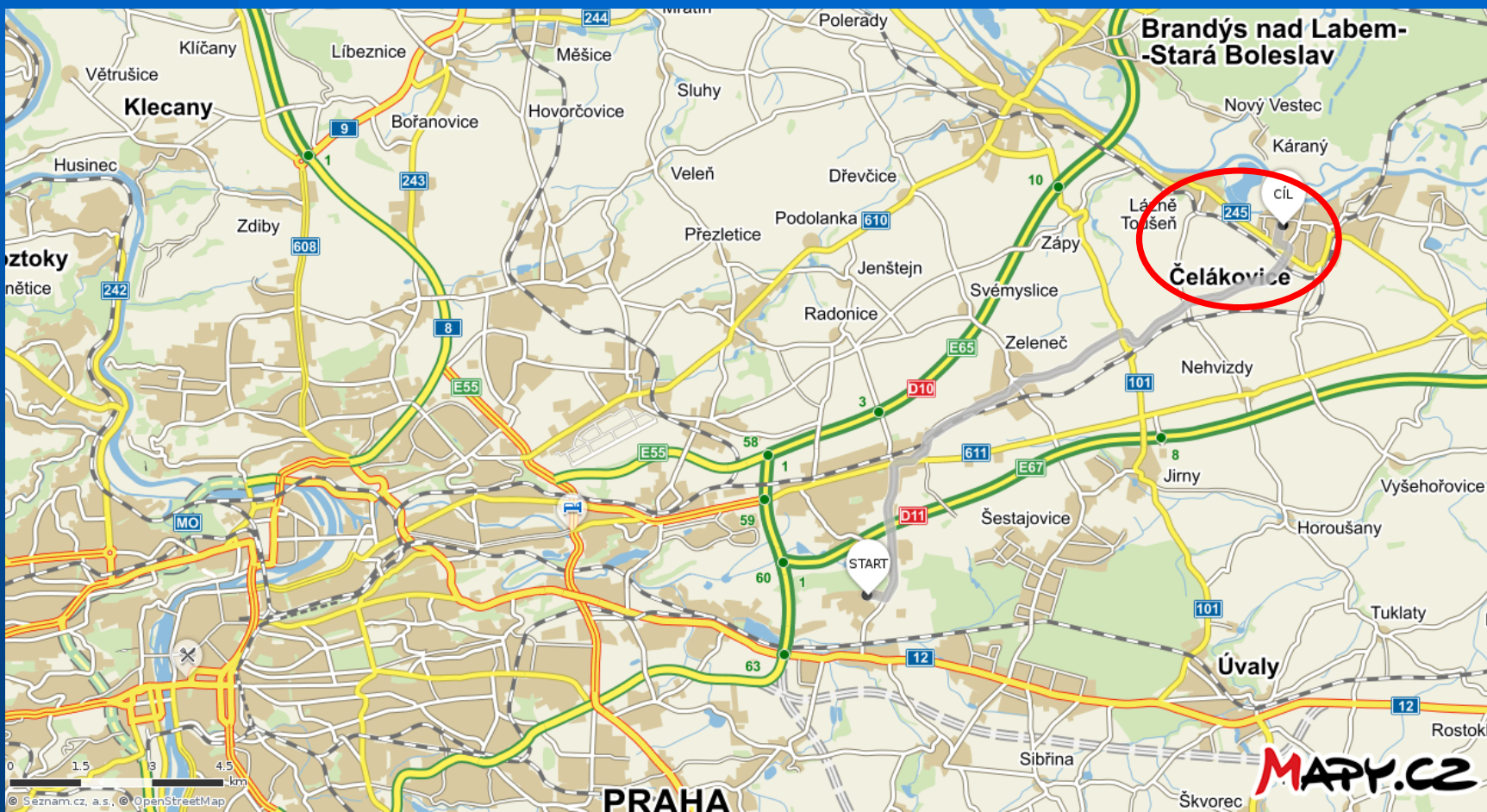


Introduction

- SVÚM a.s., previous National Research Institute for Materials, private research and testing institute (R&D performing SME) since 1995, has been involved in EUREKA projects with the UK partners already for many years, since 1994
- Most of the projects had a common platform, namely the use of innovative design and manufacture approaches in transport vehicles to reduce mass, fuel consumption, to reduce damage to roads and tracks and to reduce environmental impact in general

Introduction

- SVÚM a.s., just 25 km from Prague city centre



EUREKA projects with participation of SVÚM and UK partners:

- **Σ! 888 EUROSPPRINGS**, started 1 January 1994, 72 months
- **Σ! 1841 EUROBOGIE**, started 1 November 1997, 182 months
- **Σ! 2462 TRUS**, started 1 April 2001, 141 months
- **Σ! 2486 FOOTPRINT**, started 1 April 2001, 99 months
- **Σ! 7219 ECOVEHICLE**, started 1 July 2013, 36 months
- **Σ! 11157 ECOBOGIE**, started 1 January 2018, ongoing

Σ! 888 EUROSPPRINGS

„Development of lightweight springs and suspension components for vehicles using fibre-reinforced plastics“



Culzean Fabrics



Scott Bader Company Limited



Ror Rockwell Limited



University Of Reading/engineering Dep
University



Flemings Laces Limited



Don-bur (bodies And Trailers) Ltd.



Dr. Peter Thornburrow



Em-fiberglas A/s



Strachan & Fox Composites Limited



Polymath Engineering Technology



Plastech Thermoset Tectonics



Polymarin B.v.



University Of Latvia/institute Of Polymer Mechanics



Lti - London Taxis International



Sciotech Projects Limited
SME



Vetrotex (uk) Limited



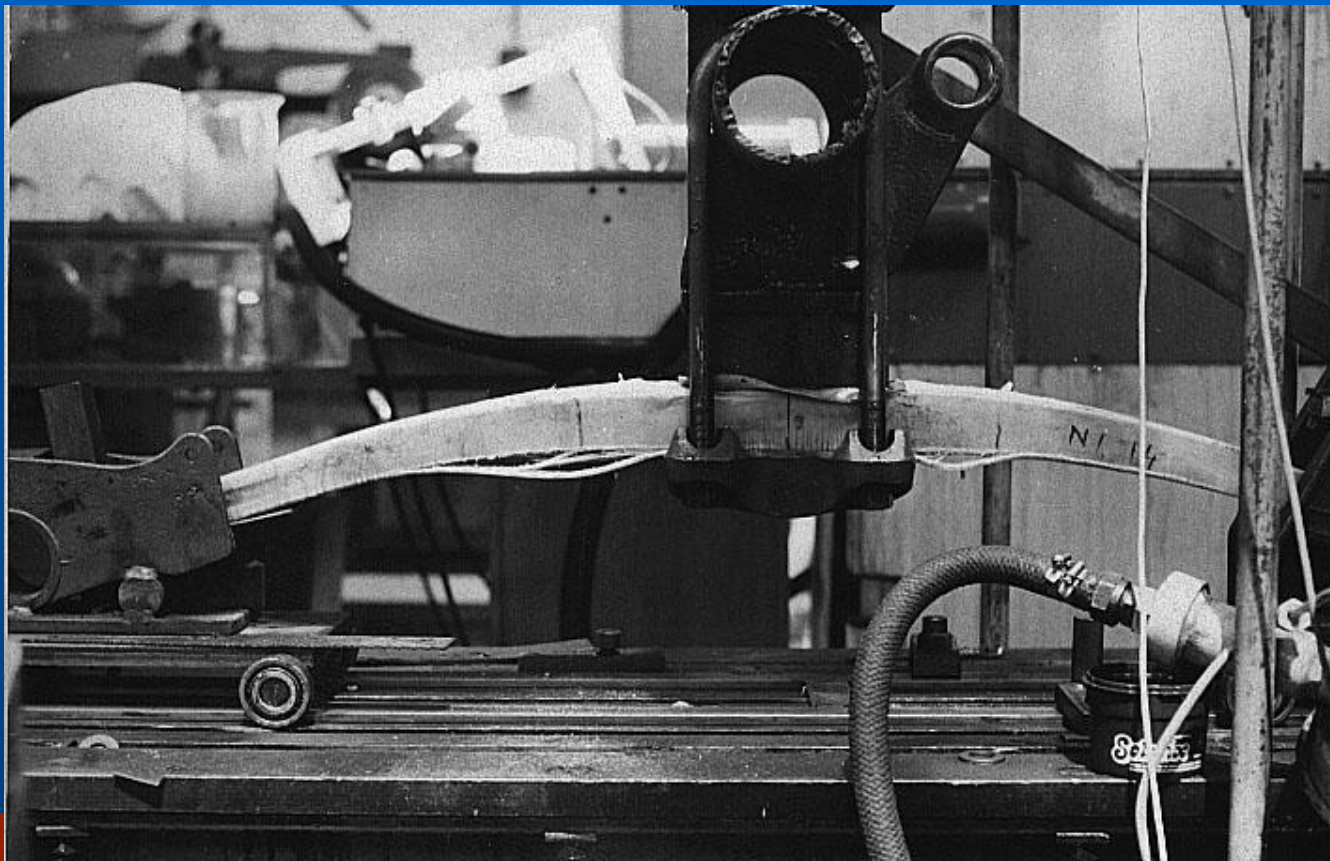
Jafi-autokut Mernoki - R & D Company For Automotive



Svum A.s. (statny Vyskumny Ustav Materialov A.s.)

Σ ! 888 EUROSPPRINGS

„Development of lightweight springs and suspension components for vehicles using fibre-reinforced plastics“



Σ! 888 EUROSPPRINGS

Conclusions:

Results of uniaxial fatigue durability tests of the five production GRP manufactured at EM Fiberglas are the following:

- All springs had an equal or very similar stiffness, within 1% or 4%, respectively.
- No spring failed during the initial proof load to 89 kN.
- Two of the five tested springs had a longer fatigue life than the target 300000 cycles. Three of them failed earlier, between 32000-210000 cycles.
- There were either no or negligible changes of stiffness during fatigue tests, even in pre-failure stage of springs which failed.
- Failure mode of the broken springs was sudden splitting by interlaminar shear.
- Strain was maximum near the central clamp exceeding 12000 $\mu\text{m}/\text{m}$ at the load 89 kN. Tension and compression strain for this load at the center of the spring arms exceeded 8000 $\mu\text{m}/\text{m}$.

Σ ! 1841 EUROBOGIE „Advanced rail suspension using fibre-reinforced plastics“



Em-fiberglas A/s



Skoda Vyzkum S.r.o.

Large company



Svum A.s. (statny Vyskumny Ustav Materialov A.s.)



Skf (uk) Ltd.



Metalastik Limited



University Of Reading/engineering Department

University



Sciotech Projects Limited

SME

Main



University Of Latvia/institute Of Polymer Mech



English Welsh And Scottish Railway



Polymath Engineering Technology



Risoe National Laboratory / Materials Research



Aea Technology Plc / Aea Technology Rail

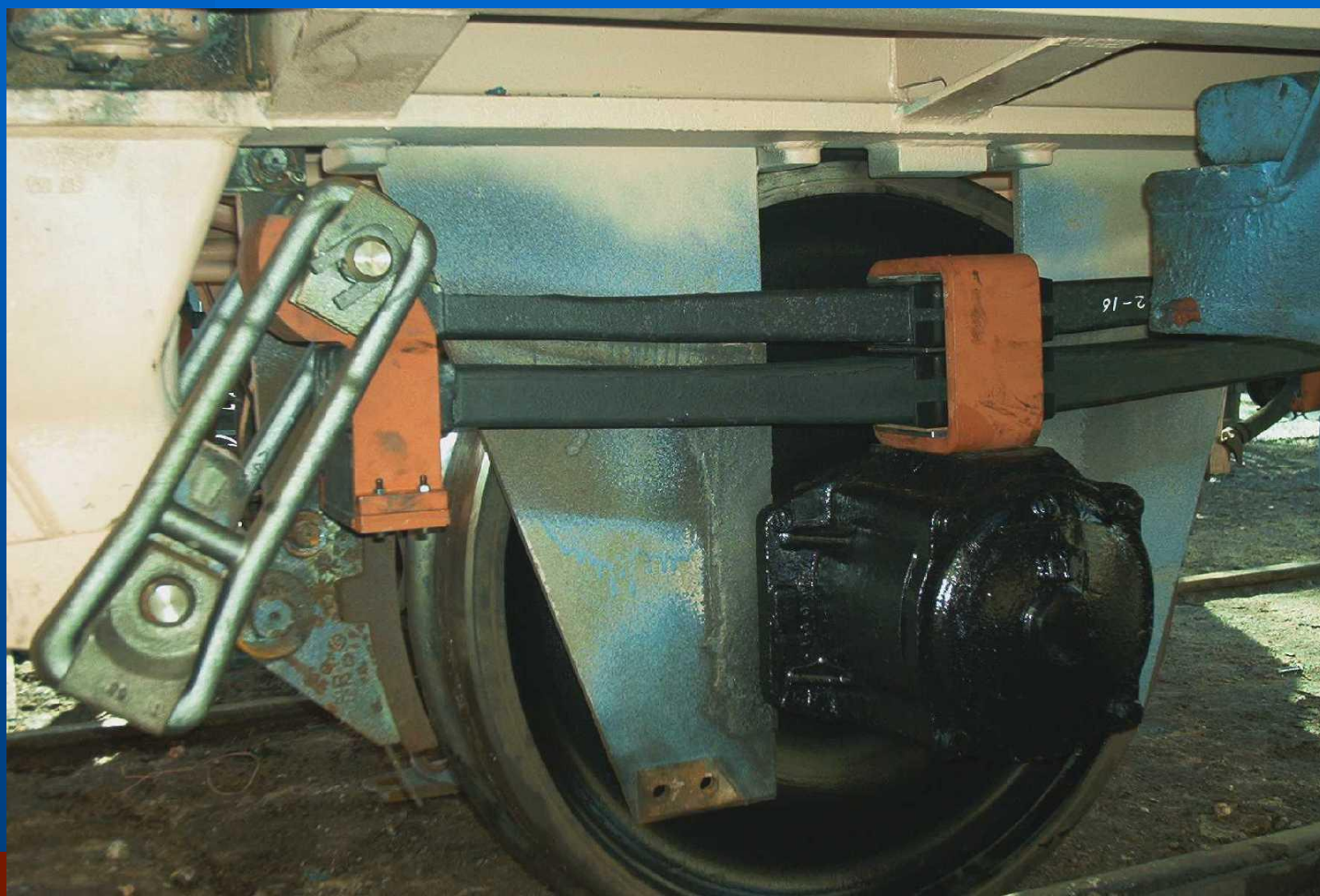


Composite Suspensions Ltd.



Concargio Ltd.

Σ ! 1841 EUROBOGIE „Advanced rail suspension using fibre-reinforced plastics“



Σ ! 1841 EUROBOGIE „Advanced rail suspension using fibre-reinforced plastics“



Σ ! 2462 TRUS „Zero emission public transport for urban areas“



University Of Reading/engineering Department

Main partner

University



Lay Construction Limited



University Of Latvia/institute Of Polymer Mechanics



Reading Borough Council



Svum A.s. (statny Vyskumny Ustav Materialov A.s.)



Lakomp Ltd.



Uwe - Engineering Department University Of The West Of England At Bristol



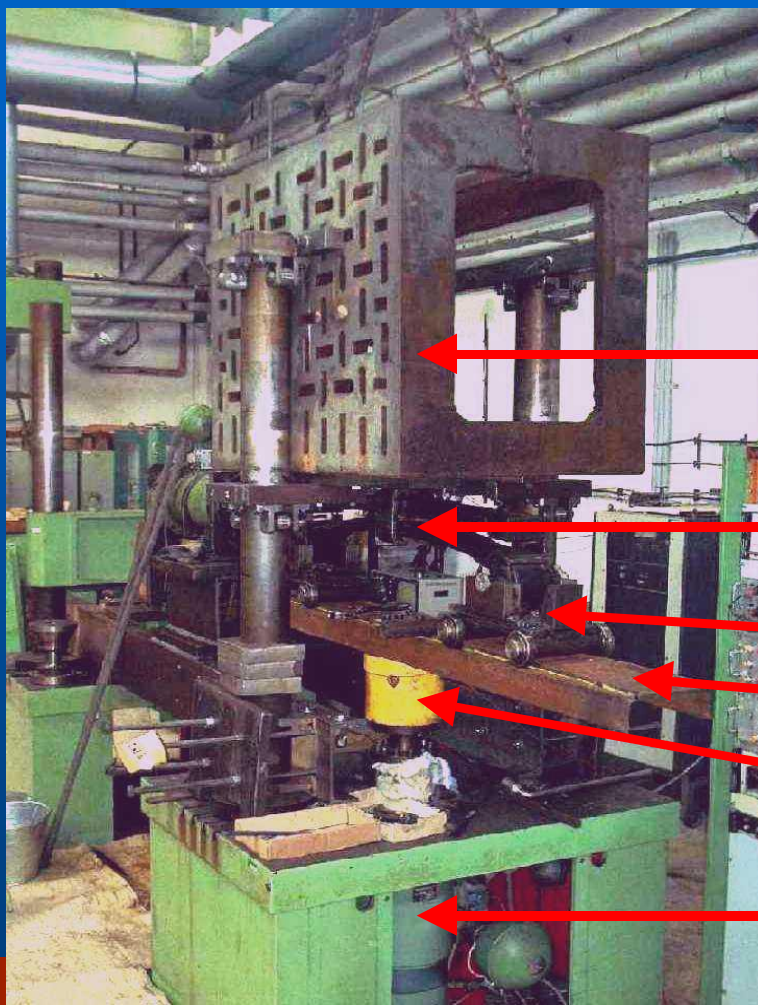
Jafi-autokut Mernoki - R & D Company For Automotive Industry Ltd.

Σ ! 2462 TRUS „Zero emission public transport for urban areas“

- Flywheel energy storage unit is the crucial component



Σ ! 2486 FOOTPRINT „Relating the environmental footprint of a vehicle to the lifetime cost of maintaining the infrastructure“



Mass

Spring

Carriages

Cross girder

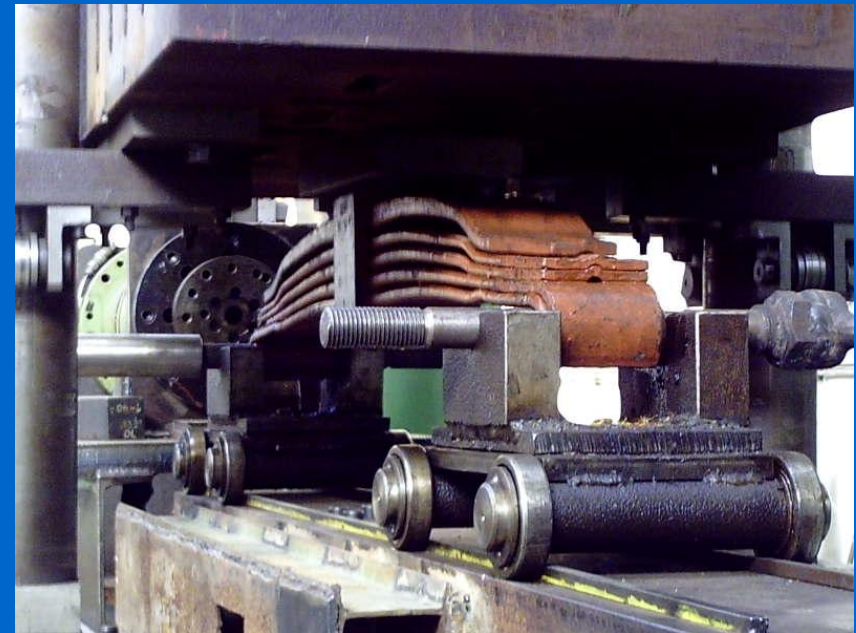
Load cell

Servohydraulic cylinder

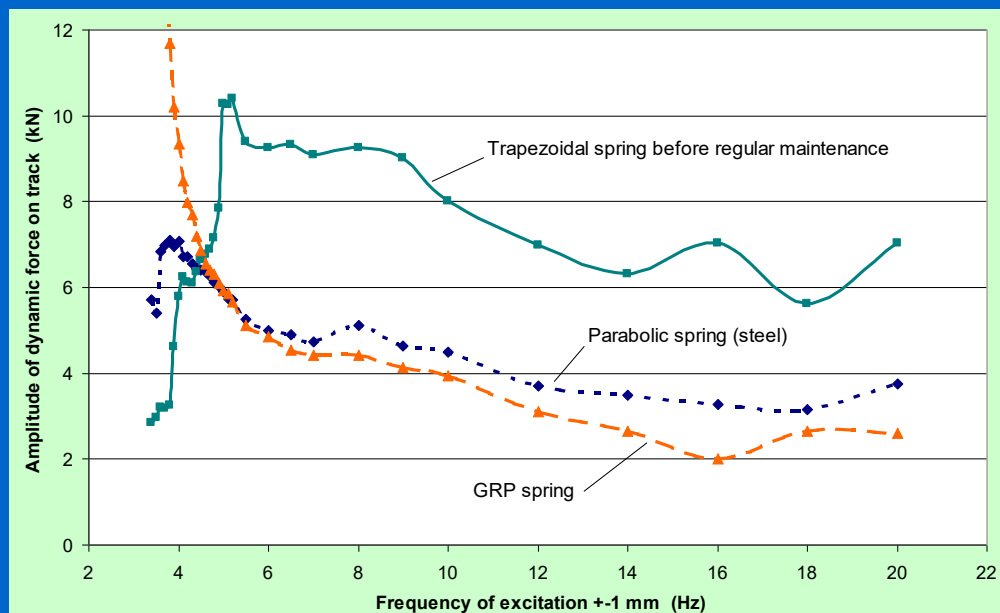
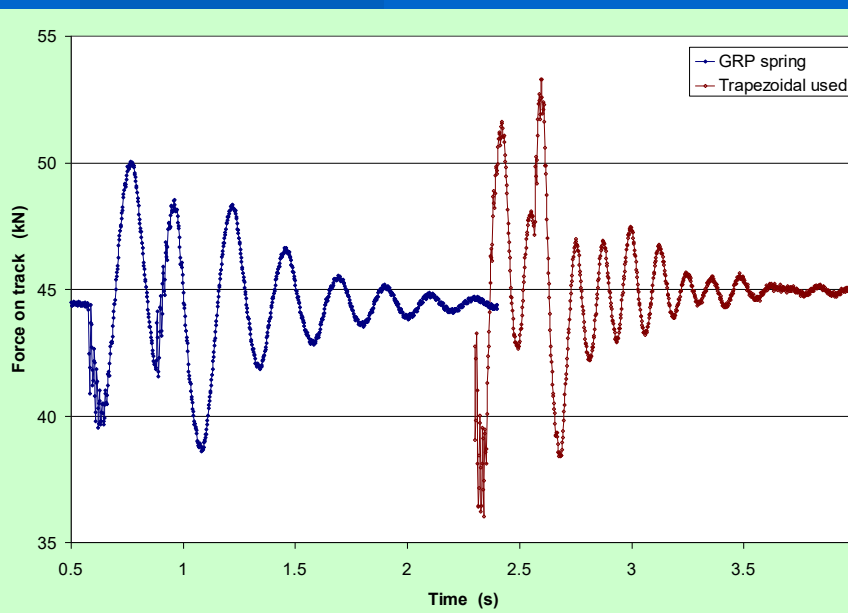
Σ ! 2486 FOOTPRINT „Relating the environmental footprint of a vehicle to the lifetime cost of maintaining the infrastructure“



Detail of GRP spring on carriages
and cross girder before lowering
the mass



Σ ! 2486 FOOTPRINT „Relating the environmental footprint of a vehicle to the lifetime cost of maintaining the infrastructure“



Σ ! 7219 ECOVEHICLE „Defining road and rail vehicles with a low environmental footprint“



Tdc Systems Ltd



Sc Intelectro Iasi Srl



Sciotech Projects Limited

SME



Empa - Materials Science And Technology Civil And Mechanical Main partner

Enigneering

Research Institute



Sc Innovative Green Power Srl



Kistler Instruments Ag



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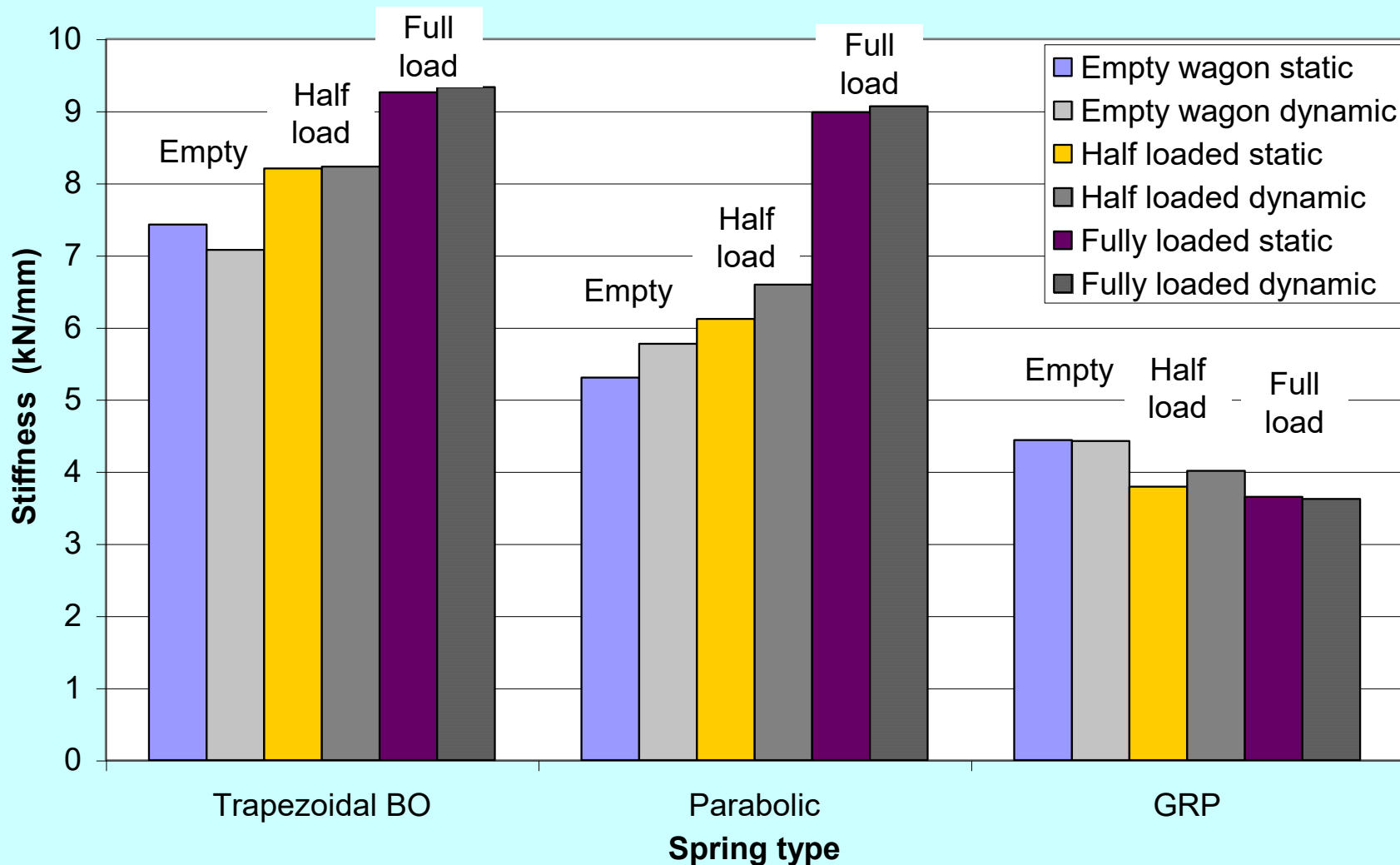


Ibi Group On Behalf Of Transport Scotland

Σ ! 7219 ECOVEHICLE



Σ ! 7219 ECOVEHICLE



Σ ! 11157 ECOBOGIE „Ecobogie – an innovative low track force, low noise bogie“

- Submitted and accepted within the bilateral Czech – German call

3. Main Participant

Main Participant

Signature

SVÚM a.s.

4. Other Participant

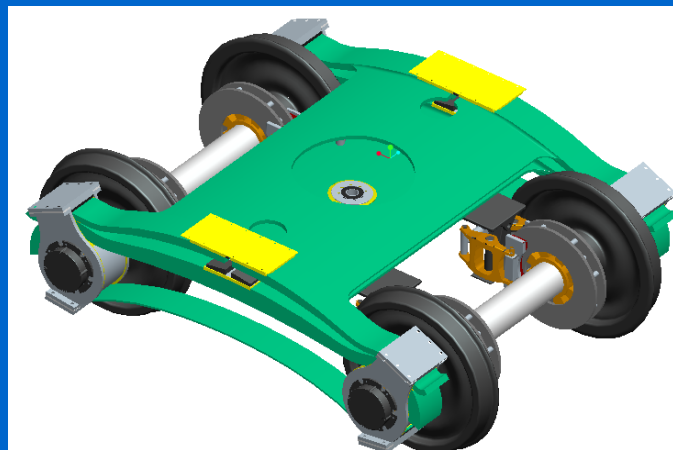
Add a participant

Modify

Remove

Signature

- 1.- Vyzkumny a zkusebni ustav Plzen s.r.o.
- 2.- NOVACOM Verstärkte Kunststoffe GmbH
- 3.- Festiniog and Welsh Highland Railways
- 4.- Inst. for Rail Vehicles & Transport Systems



Σ ! 11157 ECOBOGIE „Ecobogie – an innovative low track force, low noise bogie“

- Submitted and accepted within the bilateral Czech – German call
- The UK partners, namely regular partner FWHR and Sciotech Ltd as a subcontractor, unfortunately cannot be financially supported, which complicates the situation, the progress is partially affected by their enthusiasm
- Their role is quite crucial, Sciotech is providing design and drawings, FWHR will provide their tracks for service testing, which will be an essential step for further certification process

Σ! 11157 ECOBOGIE „Ecobogie – an innovative low track force, low noise bogie“

- **There is a very important aspect of the collaboration – the half-scale bogie according to the work plan will be tested in service of actual railways for the first time.**
- **The advantage is that FWHR are completely private railways and TSI (Technical System for Interoperability) with numerous connected standards is not fully applicable.**
- **However, the responsibility of the consortium for sufficient safety and reliability is very high – the trains are personal trains.**
- **The service evaluation will be crucial step towards a future full scale bogie for standard EU tracks**

Question: How the collaboration with the UK will look like in the near future? Will there be any?

- A new cluster has been recently established and approved – SMART Advanced Technology - 
<https://www.smarteureka.com/en/>
- 12 supporting countries (not all from EU), 9 interested
- SVÚM a.s. is a member of the Board
- During a discussion in one of the last Board meetings, there was a consensus that particularly **the UK (and German) participation would be very beneficial for the cluster** and may also be beneficial for the UK in the process of the British exit from the EU
- Previous high level of the UK contributions to EUREKA projects could continue

- Can the UK EUREKA chairmanship help to change the funding policy of the UK partners of EUREKA projects?
- Can the UK join the SMART cluster as a supporting or at least interested country?

Many thanks for your kind attention