

# EUPAVE Webinar « Dowels and tie-bars »

## Introduction and a look back on previous EUPAVE events

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Luc Rens

Technical Director, EUPAVE

# EUPAVE, the European Concrete Paving Association

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## **Our mission**

Advocate and enable wider use of cement and concrete applications in European transport infrastructure by engaging with EU, national and local decision makers, by disseminating technical know-how and communicating benefits and by promoting innovation and best practices in the sector



## **Our vision**

Cement and concrete are widely used in road networks across Europe and enable a sustainable, resilient and future-oriented transport infrastructure, for the benefit of communities and society across Europe through multiple applications including concrete pavement, safety barriers, soil treatment ...

# Previous Workshops on Best Practices

1st, 26 May 2015	Achieving and maintaining the evenness of concrete pavements
2nd, 17 February 2016	Joints in concrete pavements
3rd, 23 February 2017	The right concrete mix for the right surface
4th, 18 June 2019	Hydraulically Bound Base Layers and RCC pavements
5th, 14 October 2020	Concrete Pavement Preservation
6th, 19 October 2021	Pervious concrete pavements: an overview of European experiences
7th, 19 October 2022	Concrete Overlays
8th, 19 April 2023	Outdoor industrial and heavy-duty concrete pavements
9th, 22 May 2024	Non destructive auscultation and monitoring techniques for concrete pavements
10th, 14 May 2025	Dowels and tie-bars in concrete pavements



# Previous Webinars

7 February 2019	“Concrete Pavement Recycling and the Use of Recycled Concrete Aggregates in Concrete Paving Mixtures”
19 May 2020	“Current U.S. practices for successful design and construction of concrete overlays”
23 June 2021	“Towards a low-carbon & circular concrete”
15 February 2022	“Enhancing concrete durability”
9 March 2023	“Optimal compaction for a durable concrete surface”
20 June 2024	“The past and future evolution of load transfer systems for jointed concrete pavements”
17 June 2025	“Pavement repairs using rapid-hardening concrete”
5 March 2026	“Dowels and tie-bars in concrete pavements”



@Febelcem



@Chemcrete

# Introduction

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- Series of events on dowels and tie-bars
  - 22 May 2024: Best Practices Workshop **“Non destructive auscultation and monitoring techniques for concrete pavements”**
    - **“Dowel detection and thickness measurement”**
      - Dirk Anke, Senior Software Developer, MIT Mess- und Prüftechnik GmbH



**Dowel positions**



**Pavement thickness**

# Introduction

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- Series of events on dowels and tie-bars
  - 20 June 2024: Webinar
    - "THE PAST AND FUTURE EVOLUTION OF LOAD TRANSFER SYSTEMS FOR JOINTED CONCRETE PAVEMENTS"**
    - Mark Snyder, Pavement Engineering and Research Consultants (PERC), President
    - Presentation is still available on EUPAVE's website:  
<https://www.eupave.eu/webinar-load-transfer-systems-for-concrete-pavements/>

# Introduction

- Series of events on dowels and tie-bars
  - 2025: Best Practices Workshop

## PROGRAMME

Moderation by Mr. Jeroen de Vrieze, Cement&Beton Centrum

- 13:30 - 14:00** Welcome coffee and registration
- 14:00 - 14:10** Words of welcome and introduction to the workshop  
By Luc Rens, Managing Director, EUPAVE
- 14:10 - 14:30** More than 50 years of reliable load transfer solutions in Europe  
By Dirk Brentzel, Owner of Otto Brentzel
- 14:30 - 14:50** Glass fiber reinforced products, are you ready for the future?  
By Tom Roos, Roos Groep
- 14:50 - 15:10** From design to practice  
By Anne Beeldens, AB-Roads
- 15:10 - 15:30** Coffee break
- 15:30 - 15:50** Never too late for dowels or tie-bars – the techniques of dowel bar retrofitting and cross stitching  
By Pascal Buys, Robuco
- 15:50 - 16:10** Standardisation of dowels – where are we now?  
By Luc Rens, EUPAVE
- 16:10 - 16:30** Q&A
- 16:30** Closing reception



# Introduction

- Series of events on dowels and tie-bars
  - 2025: Best Practices Workshop
    - Dirk Brentzel
    - Presentation of the company Otto Brentzel
    - Functioning – Production – Testing – Quality Control for steel dowels and tie-bars



Our Company today!



3/4/2026

8



▶ Test of the PE-Coating during the manufacturing process



Dowel (in the lower section)



Dowel (in the upper section)

04.03.2026

# Introduction

- Series of events on dowels and tie-bars
  - 2025: Best Practices Workshop
    - Tom Roos
    - Presentation of the company Roos Groep and Fiber Dowels
    - GFRP dowels and tie-bars – several project case-studies

## Product development



FIBER DOWEL BASKETS



FIBERGLASS REBARS BASKETS



# Introduction

- Series of events on dowels and tie-bars
  - 2025: Best Practices Workshop
    - Anne Beeldens, AB-Roads
    - From design to practice
    - Radius of relative stiffness – Deflection – Bearing stress – Positioning and (mis)alignment - ...

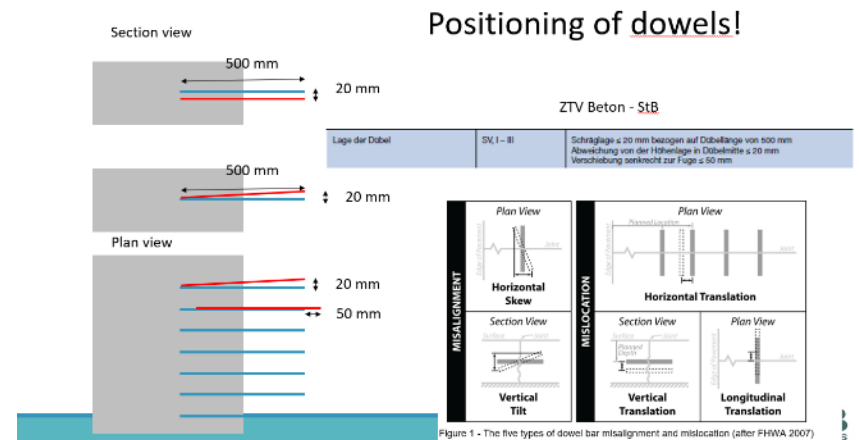
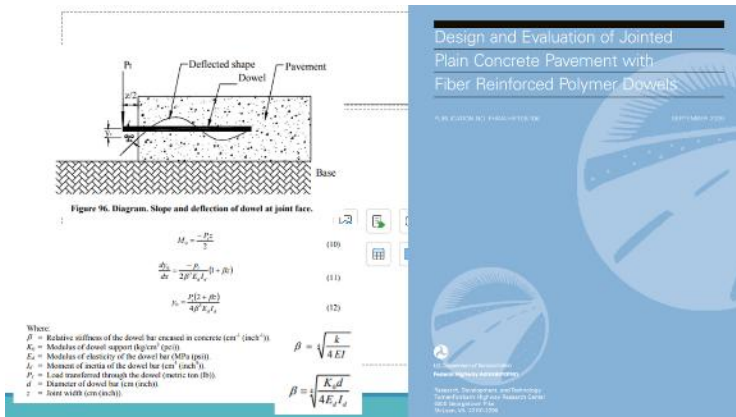


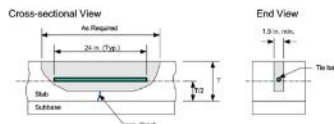
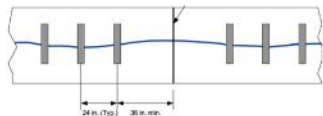
Figure 1 - The five types of dowel bar misalignment and mistlocation (after FHWA 2007)

# Introduction

- Series of events on dowels and tie-bars
  - 2025: Best Practices Workshop
    - Pascal Buys, ROBUCO
    - Never too late for dowels or tie-bars - the techniques of dowel bar retrofitting and cross stitching

## Dowel bar retrofit

Insertion of dowels in an existing pavement for load transfer  
Most common in a transverse joint or crack



## Case: E34 Antwerp-Knokke

### Drilling the holes

Presence of longitudinal reinforcement bar near to the edge made it difficult to drill the hole



# Introduction

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  - 2025: Best Practices Workshop
    - Luc Rens, EUPAVE
    - Standardisation of dowels – Where are we now?

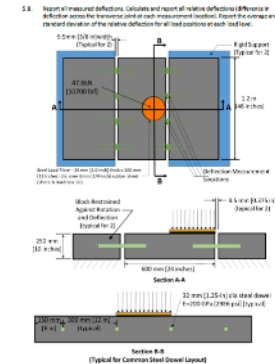
## European Standard EN 13877-3 (old)

- hEN 13877-3 Concrete pavements – Part 3: Specifications for dowels to be used in concrete pavements
  - 2004
  - Harmonised



## U.S. standards related to dowels

- Load deflection test procedure
  - 2 Joints
  - Joint opening of 9,5 mm
  - Static load 47,6 kN
  - Deflection measured at 4 points located 15 cm on either side of the center of the load plate, for both joints
  - Max. 0,25 mm relative deflection
  - An alternative test with dynamic loading is also described



# European standards – actual status

- Dowels: EN 13877-3
  - Start of CPR Acquis Process
    - Defining of essential characteristics + test methods

Essential Characteristics	Attestation of conformity systems	Classes and/or threshold values	Notes	Test method
Release of Chemicals dangerous to the environment and health	4	-	Evaluation, depending on the material used	
Tensile strength	4	≥ 250 MPa		EN ISO 6892-1 or equivalent for not metallic dowels
Shear strength	4	-		
Average bond stress	4	≤ 0,9 MPa ≤ 0,6 MPa	During the first cycle During the final pull-out	EN 13863-5
Individual bond stress	4	≤ 1,0 MPa	During the first cycle	EN 13863-5
Durability	4	-	Tested acc. to EN ISO 9227 on test specimen defined in 4	
Thickness of coating	4	0.2-0.8 mm	Only for corrosive materials	

# Our partners, involved in the dowels' and tie-bars' industry

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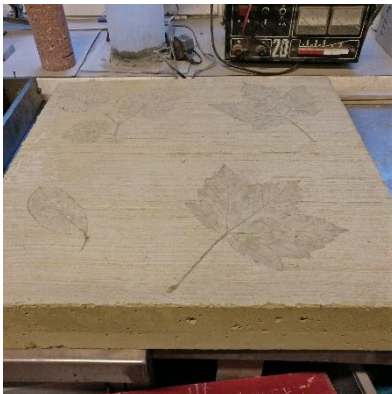




# Announcements

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- 20 May 2026 PM
- EUPAVE Workshop on Best Practices in Concrete Paving
  - Surface finishing and treatment techniques - Decorative concrete surfaces
  - Hybrid form: Brussels EUPAVE premises + online





# Announcements

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- June 2026
- EUPAVE Webinar
  - Projects & Innovations, submitted for the EUPAVE Outstanding Projects & Innovations Awards, 2025
    - Decarbonisation
    - Electrification
    - Circularity



# Announcements



## 15<sup>TH</sup> INTERNATIONAL SYMPOSIUM ON CONCRETE ROADS

Building the Future on Resilient Concrete Pavements

  
**MÁLAGA ESPAÑA**  
3-6 NOVEMBER 2026



- <https://en.concreteroads2026.com/>
- 3-6 November 2026 – MALAGA
- 136 abstracts received
- Including workshops on:
  - Port and logistic pavements
  - Airport pavements
  - Sustainability – Decarbonisation – Low-carbon cements
- Registration will soon be possible

# Time for new developments...

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## **Optimization of joint cutting positions in concrete roads using non-destructive measurement technology**

Dipl.- Ing. Matthias Herold  
MIT Mess- und Prüftechnik GmbH