

Bridge Deck Test Facility

Key words

Bridge deck waterproofing systems, bridge deck surfacing, expansion joint systems, crack bridging ability, fatigue, function test for waterproofing systems

Fields of application

Testing and approval on behalf of the Federal Ministry of Transport, Building and Housing (BMVBW); prenormative research and development; supply of technical equipment for industrial research (external use)
Safety and durability in the field of road construction and engineering

Methodology and instrumentation

Servo-hydraulic load generation (static and/or dynamic; deformation or load controlled) transmitted in a friction reduced horizontal load frame; climate chamber (temperature; humidity); load-, deformation- and climate sensors

Items tested

True-scale specimens of bridge deck surfacing systems, expansion joint systems and other waterproofing systems (max. dimensions: 250 mm x 500 mm)

Quantities / characteristics tested

Test characteristics: mechanical resilience; stiffness; deformability and deformability resistance
load horizontal: +50 kN to -50 kN; load vertical: +250 kN to -250 kN
deformation +25 mm to -25 mm, temperature: -25 °C to +70 °C, humidity: 20 % to 90 %
frequency: 0.0001 Hz to 1000 Hz
Test criteria: deformation behaviour, fatigue behaviour, impermeability, cracks, bond

Uncertainty / reliability of results

Inspection of load and deformation sensors by Calibration service:

- deformation sensors: checked according to DIN EN ISO 9513 class 1:
(resolution: $r = 1 \mu\text{m}$, rel. deviation of scales $q = \pm 0.2 \%$, abs. deviation of scales $\pm 3 \mu\text{m}$)
- load sensors: checked according to DIN EN ISO 7500-1 in 4 ranges, class 1:
(relative error of indication $q = \pm 1 \%$; rel. range 1 %; rel. deviation of scales $\pm 1.5 \%$)

Qualification and quality assurance

Own development and construction of the test equipment; unique complex test equipment for this special test purpose in Europe
Coordinated mechanical and climatic control possible; extendable to 2 axial mechanical loadings; reference test equipment
Quality assurance by regular internal and external calibration; special experiences

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Further information

- coupled control of deformation and temperature is possible
- separate visual monitoring by video is possible
- easy accessibility of the test object during all test phases
- description of durability and efficiency of complete pavements and pavement systems



Figure 1: Bridge deck test equipment (overview)

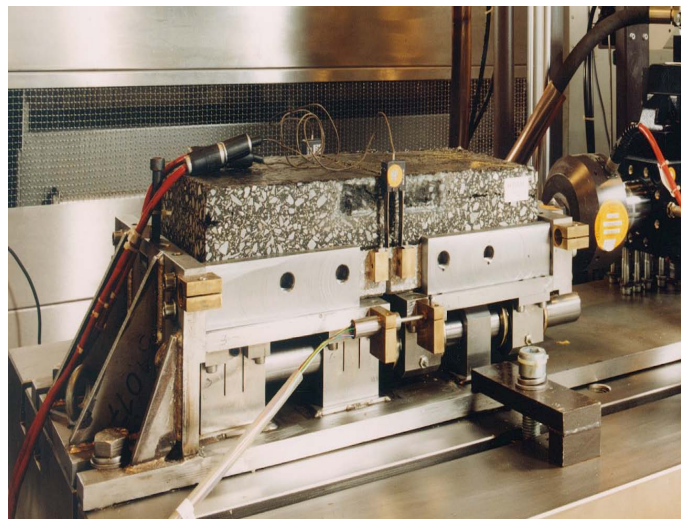


Figure 2 and 3: Mechanical load equipment with and without specimen