SYSTEM OF ROAD SURFACE MEASUREMENT AND EVALUATION IN THE CZECH REPUBLIC, NEW TRENDS IN THIS FIELD

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• news:
  - unevenness: evaluation of 3D data
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Road surface characteristics – network level

- longitudinal unevenness – IRI, straight edge value, (c – unevenness parameter: $10^{-6}$ rad·m)
- transversal unevenness – rut depth, theoretical depth of water
- macrotexture – MPD
- skid resistance – LFC
- distresses – catalogues (rigid, flexible – 15)

Road structure characteristics – project 1.

- bearing capacity FWD – remaining life ($t_z$)
- layer thicknesses GPR – longitudinal profile (2D)
- noise – SPB, CPX
Multipurpose devices – high speed measurements
- unevenness, macrotexture, video, distresses

ARAN - past

Rambøll - present (VARS)
Clasical devices – local & low speed measurements

- unevenness
- microtexture (pendulum)

**Planograph**
acceptance testing of new roads

**Straight edge:**
longitudinal evenness – 4 m
transversal evenness – 2 m
Skid resistance - devices

- longitudinal friction coefficient (LFC)

TRT - national reference device ČSN 73 6177
last compar. m.: ROSANNE (2015)
measures also IRI

Griptester
lower speeds
Classification system – network level

- described in standards (unevenness, texture, skid resistance) and TS (distresses)
- 5 classification levels, plus connected requirements

<table>
<thead>
<tr>
<th>Classification level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>$</td>
<td>RI</td>
<td>[m/km]$</td>
<td>$</td>
<td>RI</td>
<td>\leq 1.9$</td>
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1. speed > 50 km/h
2. speed ≤ 50 km/h

Acceptance testing of **new roads**
Requirements **before the end of warranty period**
Start to **plan a measure**
Carry out the measure
Quality assurance

technical specification **TP 207: Comparative measurements:**

- skid resistance (LFC)
- longitudinal unevenness (IRI)
- macrotexture (MPD)
- bearing capacity (deflection)
- thickness by GPR – **NEW** (added within currently carried out revision)
- based on **repeatability and reproducibility** (accuracy)
- authorisation from the Ministry of Transport (motorways and I class roads)
Unevenness: evaluation of 3D data

Collecting of data:
- laser scanning (static, stop&go, mobile)
- photogrammetry

http://www.jslama.cz/
Unevenness: evaluation of 3D data

Interpretation of data:
- DMT software ATLAS v.16
Unevenness: evaluation of 3D data

IRI calculations

Ostrava
IRI = <2.0, 4.0>
σ\text{repeatability} = 0.13 \text{ m/km}
σ\text{accuracy} = 0.24 \text{ m/km}

Lipník
IRI = <0.5, 2.0>
σ\text{repeatability} = 0.11 \text{ m/km}
σ\text{accuracy} = 0.17 \text{ m/km}

http://www.jslama.cz/
Unevenness: evaluation of 3D data

Straight edge 4 m calculations

Ostrava
\[ \sigma_{\text{repeatability}} = 0.45 \text{ mm} \]
\[ \sigma_{\text{accuracy}} = 0.86 \text{ mm} \]

Lipník
\[ \sigma_{\text{repeatability}} = 0.41 \text{ mm} \]
\[ \sigma_{\text{accuracy}} = 0.74 \text{ mm} \]

http://www.jslama.cz/
Unevenness: evaluation of 3D data

http://www.jslama.cz/
Skid resistance: new TRT devices

- modernisation of the measurement system – 2 new devices (2017)
  – Mr Nekula and CDV

- sustainability of this traditional type of measurement and evaluation
  (classification, connected measures - ČSN 73 6177; evaluation of pavement surfaces - 19)
TSD-FWD comparative measurements

- **FWD RODOS** - Czech producer
- 2014: ANAS TSD device - in Italy close to Rome
- 2015: IBDiM TSD - in Slovakia (3 sections – 7 km in total)
- 2016: IBDiM TSD - in the **Czech Republic** – October/November (> 100 km)

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http://www.bestinfra.cz/
Thank you for your attention.

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