Light Rail Day 2016

Noise and Wear Reduction – Stationary Rail Lubrication in Bergen

November 2016
Content

• Motivation
• Stationary rail lubrication systems in Bergen
  • System layout
  • Impressions
• Elimination of squealing noise
  • Background and practical experience
• Reduction of wear
  • Practical example
• Possibilities and potentials of rail lubrication
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Situation

• Number of light rail traffic companies has gone up by 30% since 1980
• New light rail system in Bergen (Bybanen) since 2010
• Residents are getting more and more sensible concerning noise problems
• Rail squealing is inherent to the system

Motivation of Bybanen

• Elimination of squealing noise with stationary rail lubrication systems
• Failure safe and service friendly systems
• Minimal amount of gease and clean tracks
• Maximal operational safety
• Complete solution from one source
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Rail lubrication in Bergen

Lubrication line

System core

Sensor for the detection of single wheels
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Rail lubrication in Bergen

Location 1

Location 2
Hier am besten eine Straßenkarte mit Standorten vorher und nachher Bilder

Location 1
Hier am Besten eine Straßenkarte mit Standorten Vorher und nacher Bilder

Location 1
Location 2
Location 3
Location 4
Location 5
Location 6
Location 3
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Typical noise sources in light rail systems

- Flank squealing
- Rail head squealing
- Ground vibration (solid-borne sound)
- Flat spots
- Rumble noise (e.g. corrugation)
- Rolling noise
Measurement: passage of a bend

- **Without rail lubrication**
- **With rail lubrication** (Typ: moklansa **SKBS**)
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Track parameters

- Rail profile: Ri59N (Ri59R13)
- Rail grade: R200
- Track gauge: 1435 mm
- Radius: 50,5 meter
- Sub-construction: slab track
- Last track renewal: august 2009

Passing the curve

- Approx. speed: 20 km/h
- Number of transits per direction: 280 – 330
Result of measurement (at the outer rail)

<table>
<thead>
<tr>
<th></th>
<th>Lubricated</th>
<th>Not lubricated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worn area</td>
<td>66 mm²</td>
<td>289 mm²</td>
</tr>
<tr>
<td>Lateral worn</td>
<td>1,87 mm</td>
<td>6,23 mm</td>
</tr>
<tr>
<td>Factor</td>
<td>4,38</td>
<td>3,33</td>
</tr>
</tbody>
</table>
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Possibilities and potentials of rail lubrication

- Sustainable elimination of squealing in railway curves
- Significant reduction of wear in the wheel-rail contact
- Suitable for grooved and vignol rails, as well as guard rails
- Maximal process safety without undefined grease output
- Operation in sensitive areas possible (e.g., pedestrian zone)
- Maintenance-friendly grease reservoir
- Extensive options and accessories
- Complete solutions from one source
- ...
Thank you for your attention!

further information:
www.moklansa.de

For any questions please get in touch with us at:
+49/2301/94 93 68-0,
or by e-mail:
info@moklansa.de