Research, Educational and Other Activities at IMID

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IMID SEMINAR
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Contents

• Research activities
  • Introduction and motivation
  • Background
  • Results
• Educational activities
• Events and UK/BUT activities
• Other activities

Rail Track Worldwide per County:
- 60 000 km
- 30 000 km < 59 999 km
- 20 000 km < 29 999 km
- 15 000 km < 19 999 km
- 10 000 km < 14 999 km
- 5 000 km < 9 999 km
- 0 km < 4 999 km
- 0 km < 4 999 km
Introduction and motivation

- Adhesion loss
- Wear
- Corrugation
- Noise and vibration
- High contact forces
- Wheel flange lubrication
- Sanding
Introduction and motivation – Friction Manage

Wheel flange lubrication

Cracks

Microfracture

Adhesion loss

Sanding

Contact forces

Corrugation

Noise

Top of rail friction modifiers

Wear
The goal of thesis is to clarify the effect of oil-based FMs on adhesion and wear.

<table>
<thead>
<tr>
<th>Part. size (µm)</th>
<th>FMA</th>
<th>FMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>145 915</td>
<td>3 560 883</td>
</tr>
<tr>
<td>10-20</td>
<td>12 171 798</td>
<td>147 966</td>
</tr>
<tr>
<td>20-30</td>
<td>888 070</td>
<td>7 446</td>
</tr>
<tr>
<td>30-40</td>
<td>69 201</td>
<td>512</td>
</tr>
<tr>
<td>40-50</td>
<td>5 299</td>
<td>102</td>
</tr>
<tr>
<td>60-70</td>
<td>474</td>
<td>0</td>
</tr>
<tr>
<td>70-80</td>
<td>40</td>
<td>51</td>
</tr>
</tbody>
</table>

Ball on disc apparatus
I. study

The goal of thesis is to clarify the effect of oil-based FMFs on adhesion and wear.
I. study

- The goal of thesis is to clarify the effect of oil-based FM on adhesion and wear.

Average values of wear rate, roughness, path width and scratch depth
I. Study

- The goal of thesis is to clarify the effect of oil-based FMs on adhesion and wear.

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**Effect of FMA amount on adhesion**

**Striebeck curves at 10% slip**
II. study– field tests

22.3  Select of testing track
30.3  Select of testing track
16.5  Corrug. measurement
II. study – field tests

22.3 Select of testing track
30.3 Select of testing track
16.5 Corrug. measurement
25.5 Off-board system
11.8 Braking test n. 1
1.9 Braking test n. 2
8.9 Braking test n. 3
II. study—field tests

22.3 Select of testing track
30.3 Select of testing track
16.5 Corrug. measurement
25.5 Off-board system
11.8 Braking test n. 1
1.9 Braking test n. 2
8.9 Braking test n. 3
11.8 Railway noise - on
1.9 Railway noise - off
8.9 Railway noise – off
21.11 Railway noise – off

IMID SEMINAR
II. study—field tests

22.3 Select of testing track
30.3 Select of testing track
16.5 Corrug. measurement
25.5 Off-board system
11.8 Braking test n. 1
1.9 Braking test n. 2
8.9 Braking test n. 3
11.8 Railway noise - on
1.9 Railway noise - off
8.9 Railway noise - off
21.11 Railway noise – off
12.11 Corrug. measurement

time: 1:00 a.m.
temperature: 1 °C
II. study– field tests

Article in press

off-board system

corrugation

SEM of FM

Article in press

Article in press

Article in press
PhD Thesis progress and schedule for upcoming year

- Galas R, Omasta M, Krupka I, Hartl M. Laboratory investigation of ability of oil-based friction modifiers to control adhesion at wheel-rail interface. Wear. 2016;368-369,230-238. *IF 2.32*

- Galas R, Omasta M, Krupka I, Hartl M. Risk associated with application of friction modifier: the influence of applied amount on tram braking distance. *Under review*

- The behaviour of friction modifier under different lubrication regime - *Preparation of experiments* (April 2017)


**04/2017**
- The Stephenson Conference in London

**05/2017**
- RISEN Workshop in Valencia

**07/2017**
- ICRT in Chengdu

**08/2017**
- Deadline for submission of dissertation thesis
Winter semester

- **3CD** CAD
- **CKP** Machine Design and Machine Elements
- **ZTR** Tribology
- **ZKP** Team project

Summer semester

- **6KT** Machine Design – Machine Drives

Supervising

- Bachelor thesis supervising 1x
- Diploma thesis supervising 2x
Events and UK/BUT activities

Internship at TU Munich - FZG

5th - 10th June
Events and UK/BUT activities

Risen Workshop

Birmingham 27th - 29th June
Events and UK/BUT activities

Event for new master's students

Mikulov 16th - 18th September
Events and UK/BUT activities

Academic Senate

since 09/2015
UK Rail Research Group Wishes You Merry Christmas, Happy New Year and many publications!

Thank you for your attention.