

Research, Educational and Other Activities at IMID

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IMID SEMINAR

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Institute of Machine
and Industrial Design

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 - Background
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Rail Track Worldwide per County:

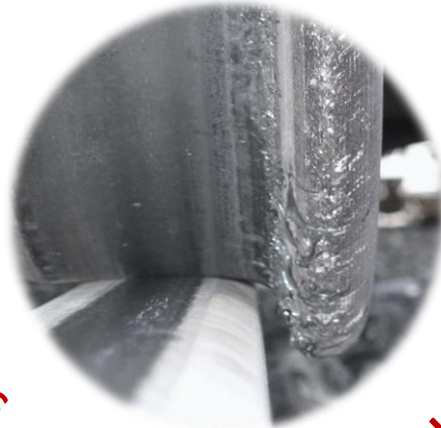
- 60 000 km
- 30 000 km < 59 999 km
- 20 000 km < 29 999 km
- 15 000 km < 19 999 km
- 10 000 km < 14 999 km
- 5 000 km < 9 999 km
- 0 km < 4 999 km

Introduction and motivation

Adhesion loss



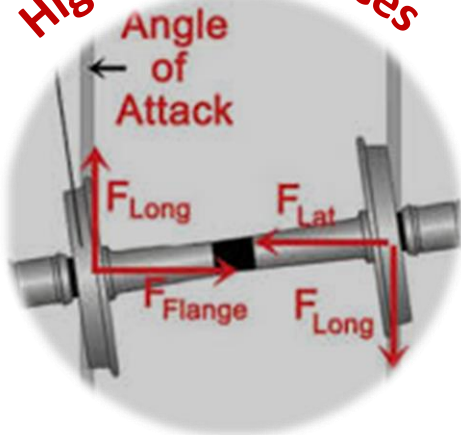
Wear



Corrugation



High contact forces



Noise and vibration



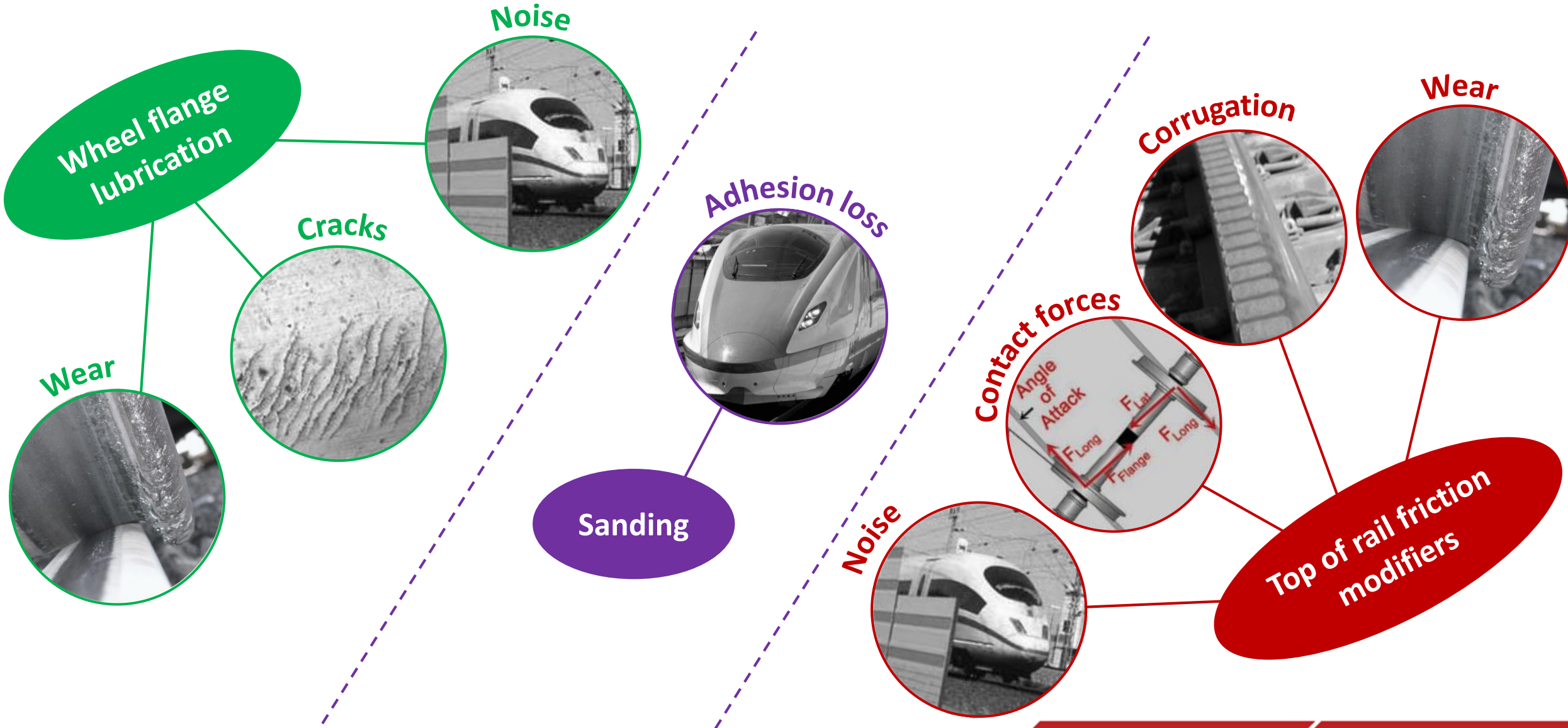
Wheel flange lubrication



Sanding

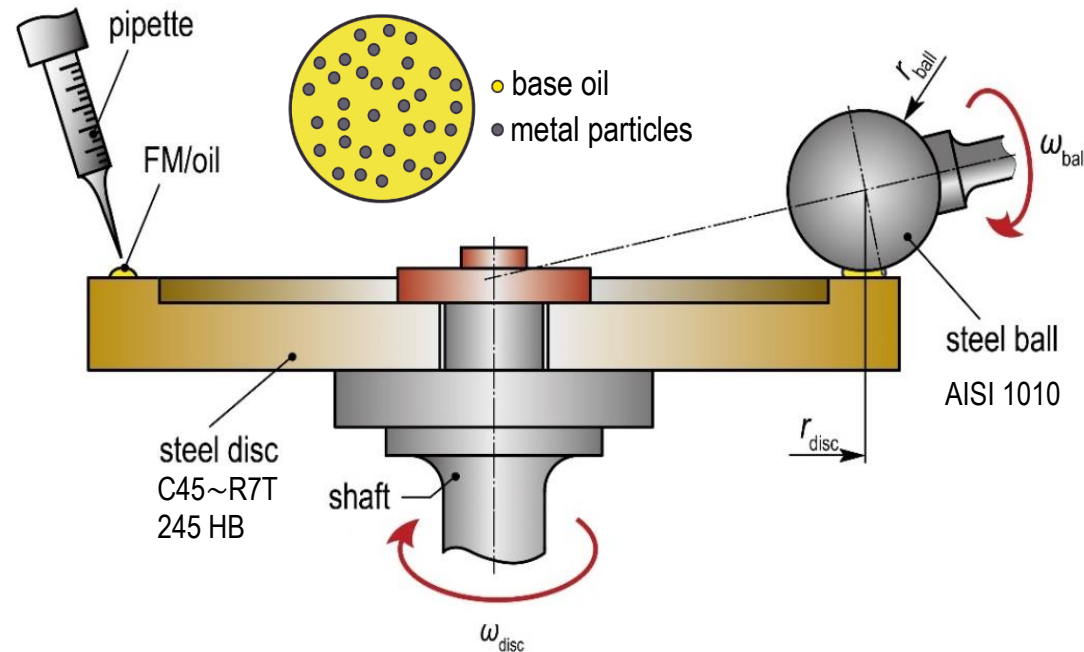
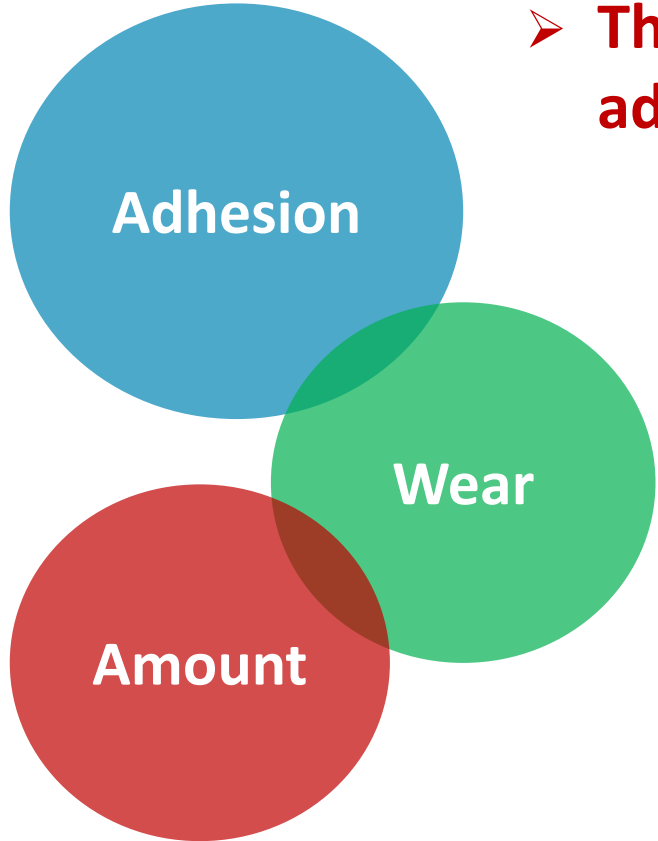


Introduction and motivation – Friction Manage



I. study

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



Ball on disc apparatus

Particle size distribution

Part. size (μm)	FMA	FMB
1-10	145 915 182	3 560 883
10-20	12 171 798	147 966
20-30	888 070	7 446
30-40	69 201	512
40-50	5 299	102
60-70	474	0
70-80	40	51

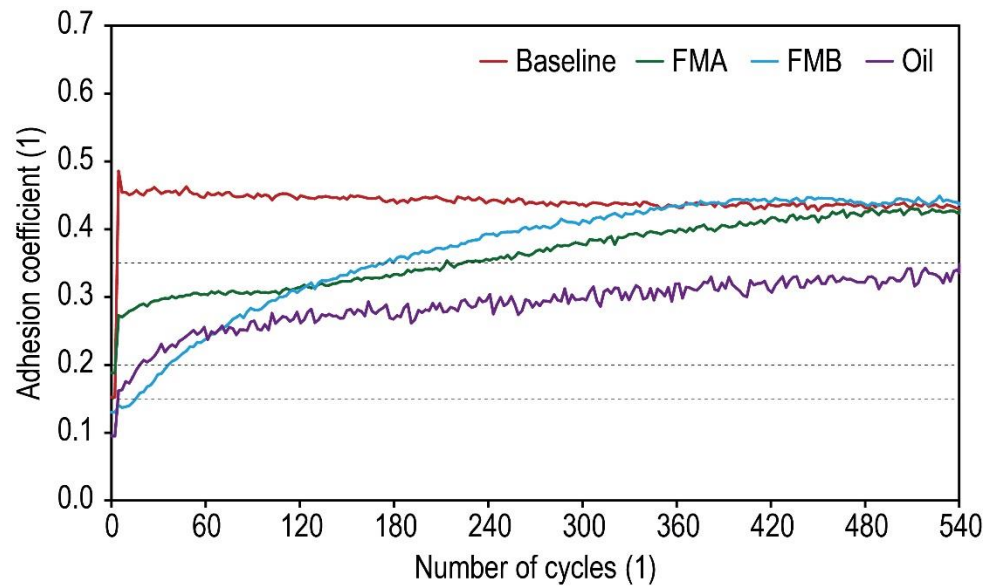
I. study

Adhesion

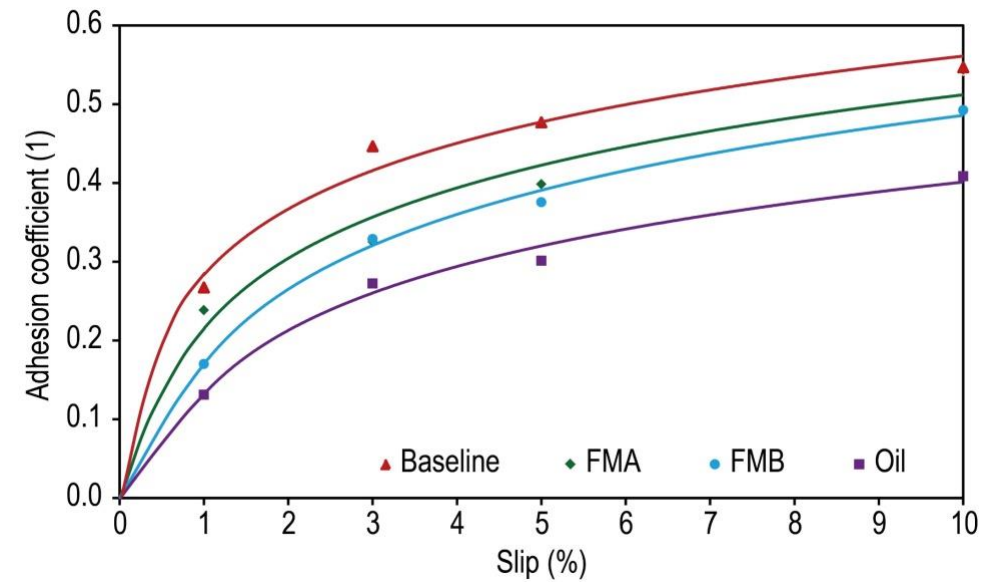
Wear

Amount

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



Time test at 3% slip



Adhesion curves

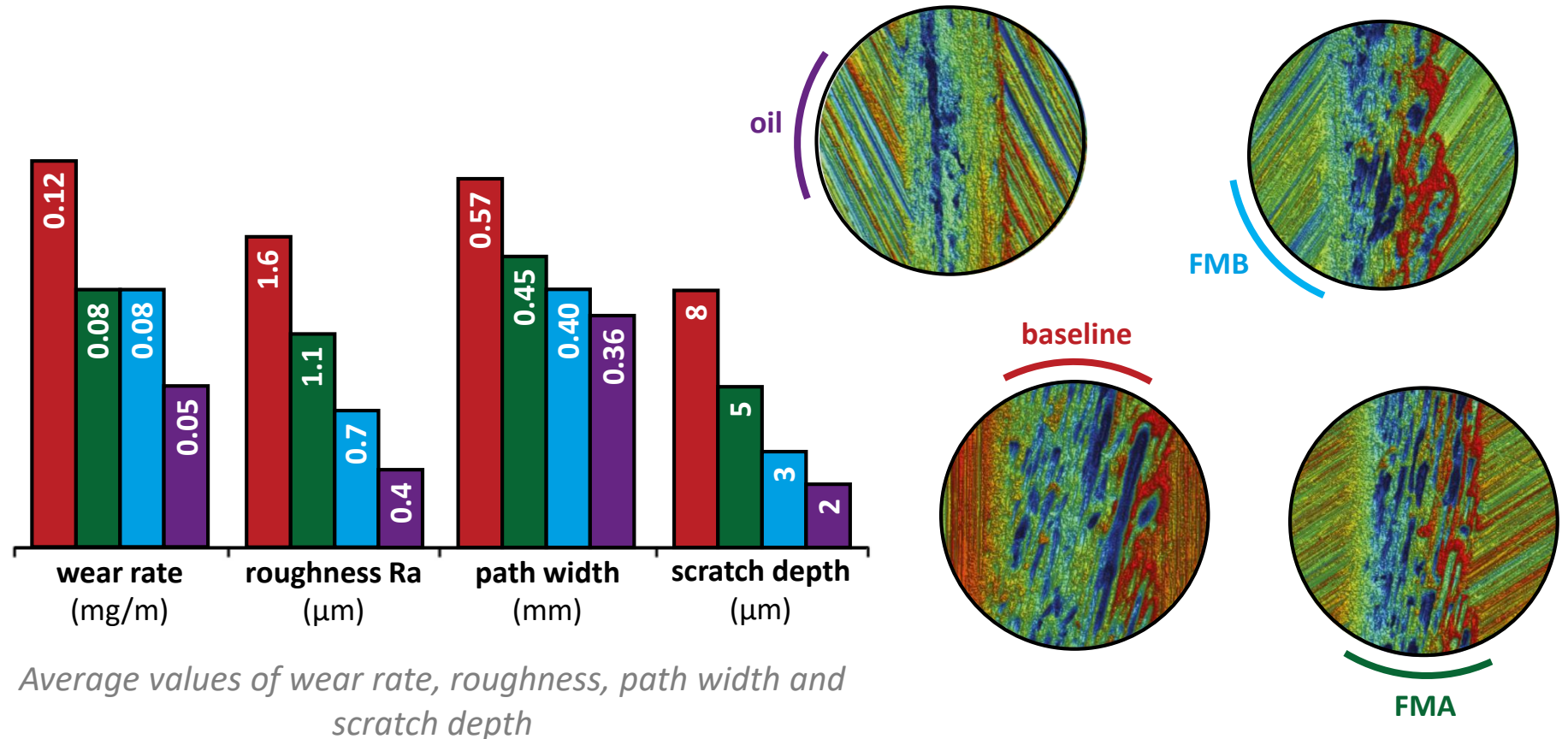
I. study

Adhesion

Wear

Amount

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



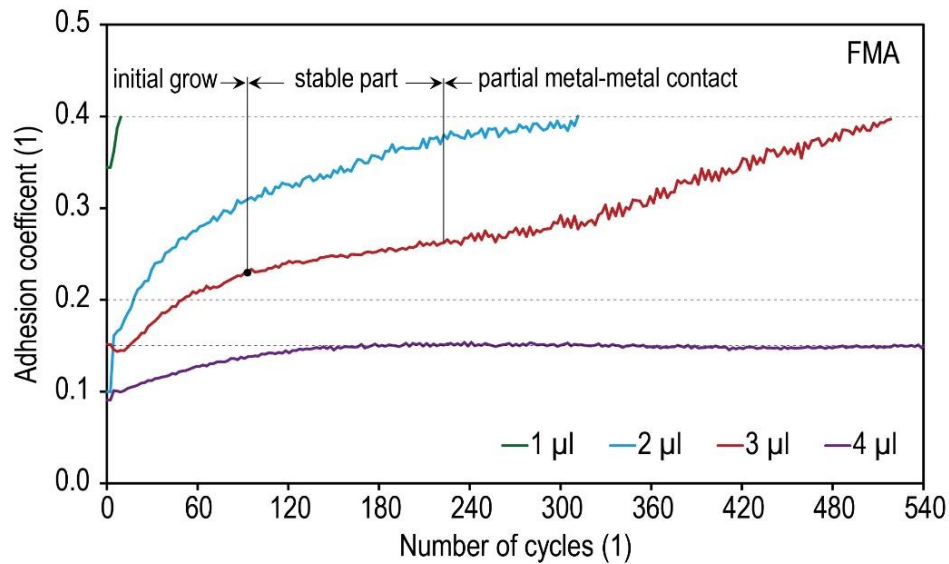
I. study

Adhesion

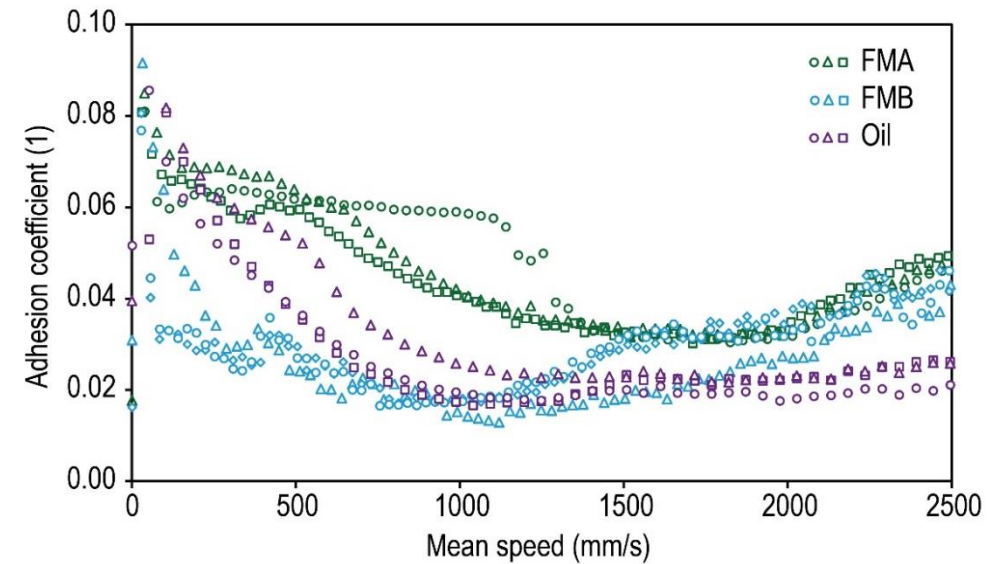
Wear

Amount

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



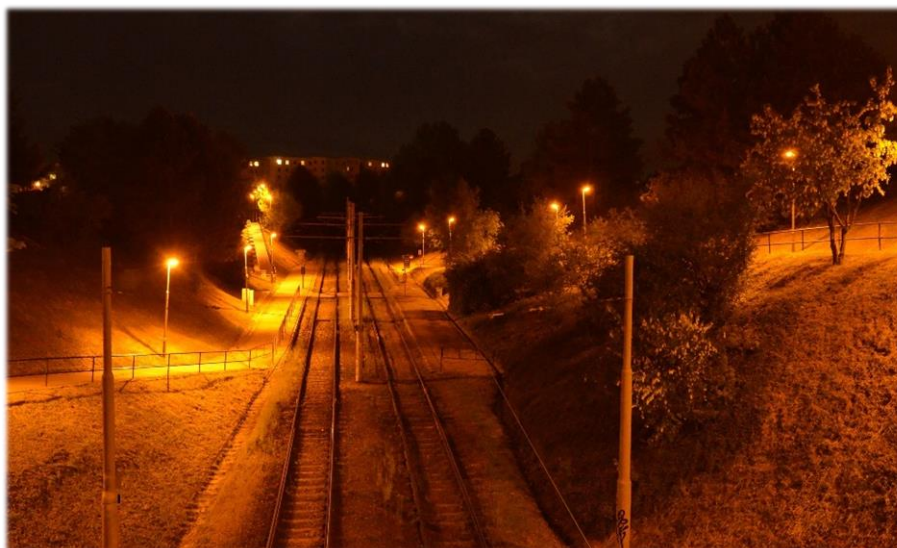
Effect of FMA amount on adhesion



Stribeck 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*



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*
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- 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

Article in press

off-board
system

corrugation

Article in press

Article in press

SEM of FM

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)
- ❖ Galas R, Kvarda D, Omasta M, Krupka I, Hartl M. The effect of composition of water-based friction modifier on adhesion and wear in wheel-rail contact. *Article in preparation*

04/2017

- ❖ The Stephenson Conference in London

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05/2017

- ❖ RISEN Workshop in Valencia



07/2017

- ❖ ICRT in Chengdu



08/2017

- ❖ Deadline for submission of dissertation thesis

Winter semester

Winter semester

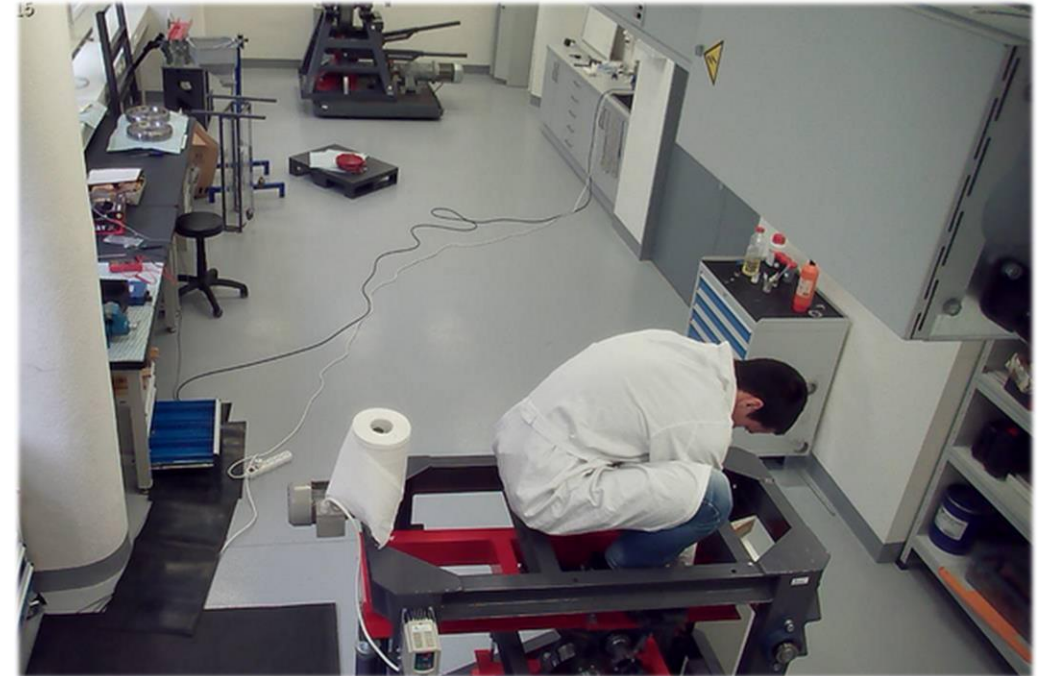
- ❖ **3CD** CAD
- ❖ **CKP** Machine Design and Machine Elements
- ❖ **ZTR** Tribology
- ❖ **ZKP** Team project

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



Institute of Machine
and Industrial Design