Wheel-Rail Tribology: Causes of Low Adhesion, Benchmarking of Applied Products, & the Future of Friction Management.

(or what happens to friction & wear when something is put between the wheel & the rail)

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Impact Statement & Outline of Research

The research to be carried out concerns three areas concerning the wheel/rail contact: Applied products, causes of low adhesion & how should the wheel/rail contact be managed in the future.

The tribo-system involved at the wheel/rail contact is open and thus can be very transient. The varying of the contact conditions with changing contaminants and variable environmental conditions has an impact in many areas: energy requirement increase therefore less “fuel” efficient, more damage & wear on both wheel and rail leading to shorter life cycles, and in the worst case derailment & rail failure causing major accidents.

This research hopes to assess the products that are applied to track to allow standards to be produced. This will also encompass testing on different scales: from full scale, through twin disc testing, to simplified pendulum testing. The aim being increased control of contact conditions through simplification of test method. This will allow for control of environmental conditions such as temperature and humidity, as well as quantity of contaminant at contact.

Research Concerns of the Wheel/Rail Interface.

1. Understand
   - Further understand the Causes of Low Adhesion
2. Benchmark
   - Products that are applied to the wheel-rail interface.
   - Simplification & Comparison of test methods
3. Improve
   - Look at the future of friction management
     - Materials as well as products.

Why?

- For Train Companies as well as Rail infrastructure owners.
  - Better friction management = Less “Waste”
  - Do products do what they advertise
- Improved knowledge for more targeted developments
  - In Strategy & Product

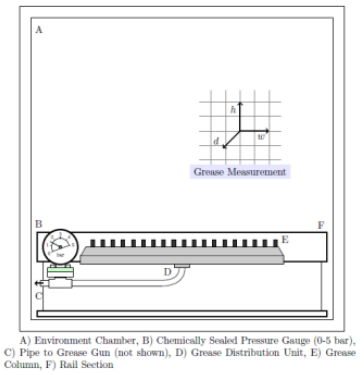
Test Equipment

Test equipment that is intended to be used:

- Full Scale Test Rig
- Sheffield University ROlling & Sliding (SUROS) Rig
- CETR Pin-on-Disc & Reciprocating Ball-on-Flat
- Mini Traction Machine
- Modified Pendulum

Examples of Third Bodies/Products

Rail Contaminants
- Leaves
- Oxides



A) Environment Chamber, B) Chemically Sealed Pressure Gauge (0-5 bar), C) Pipe to Grease Gun (not shown), D) Grease Distribution Unit, E) Grease Column, F) Rail Section

Curve Lubricants

T.O.R. Friction Modifiers

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