KELTRACK®
Top of Rail Friction Modifier

SECTOR
Rail Infrastructure

AVAILABLE
Worldwide
Friction management refers to the intentional adjustment of the friction levels between the “gauge face/wheel flange” and the “top of the rail/wheel tread”. L.B. Foster specifically developed the top of rail friction modifier KELTRACK® which is fully Network Rail approved.

**A leader in track products**
L.B. Foster has been a pioneer in friction management for more than 25 years and has specific expertise in and understanding of the fundamentals of the mechanisms behind wheel/rail interaction.

**KEY BENEFITS**
- Improves steering and reduces flange contact
- Reduces top of rail noise directly and flanging noise indirectly.
- Optimises friction and reduces wear without effecting braking performance
- Reduces creepage forces with optimised coefficient of friction
- Reduces stick slip mechanism and associated wear and corrugation.
- Ensures a consistent intermediate friction layer, which reduces lateral forces.
- Water based product which is non-flammable, non-volatile and environmentally friendly.
ISSUES IN FRICTION MANAGEMENT

- Noise/Squeal
- Wear
- Rolling contact fatigue
- Corrugation
- High lateral forces/derailments

Noise emissions from railway lines are a key environmental impact and a measure for the quality of operation of a railway system. Particularly in curves, wheel flanging and squeal noise is an issue many operators and infrastructure owners suffer from, as it affects the passenger experience as well as the quality of life for nearby residents.

In curving, below a certain radius, train wheels contact the side of the rail with the flange. L.B. Foster’s KELTRACK® applied to the top of both rails improves steering and reduces the degree of flanging contact without loss of traction or risk to braking, as experienced with oil or grease based products. These improvements have been found to dramatically reduce noise emissions, decreasing flanging noise and eliminating TOR curve squeal.

Corrugation comprises the formation of a periodic wave-shaped irregularity on the rail head, predominantly occurring in curves of medium to small radius. Their formation reduces rail life through a combination of fatigue effects and the use of grinding to remove them which further increases the rate of rail consumption. Another negative side effect is the generation of noise and vibrations with vehicles running over corrugated rail sections.

The use of KELTRACK® in the wheel rail interface provides the means to mitigate or even suppress the mechanisms associated with corrugation formation.

Rail and wheel wear is associated with damage to surfaces, which usually involves progressive loss of material, Rolling Contact Fatigue and/or plastic flow. The application of KELTRACK® reduces creepage forces and improves the steering behaviour of the vehicle. The optimised coefficient of friction on TOR reduces wheel tread/rail head wear, wheel flange/rail gauge face wear and extends the time to formation of RCF damage. Wear and RCF reductions can be directly translated into extension of rail grinding, wheel truing cycles as well as overall rail and wheel life.

LATERAL FORCES

In railway vehicle dynamics, lateral forces comprise all forces acting in the lateral direction, including centrifugal force, flanging force and lateral creep forces. High lateral forces are known to cause track structure degradation and high rates of wheel/rail wear besides other unwanted effects. Flange climb derailments are also a direct result of the lateral force becoming proportionately too high. The magnitude of lateral forces can be influenced by train suspensions and bogie characteristics, track geometry and wheel/rail profiles as well as the friction conditions.

KELTRACK® directly reduces lateral forces by providing an intermediate coefficient of friction and improving steering behaviour and reducing derailment risk. This effect can not only be seen in curves but also at features such as switches and crossings. Latest field studies have shown at least a six-fold increase in switch blade life where repairs had previously been undertaken every three months. Fully Network Rail approved, approval number PA05/01048.