

FLEXIBILITY, ACCESSIBILITY, VALUE

Kelsan® Solutions ARE RICH IN FEATURES AND TECHNOLOGY THAT DELIVER POWERFUL FRICTION CONTROL SOLUTIONS

WHY KELSAN® ?

- Kelsan®, with over 100 satisfied customers, has a proven track record of providing effective and reliable solutions.
- Our products are produced under tight quality control governed by our ISO 9001:2000 certification.
- We have in-house R&D and field technicians including several PhD's and certified engineers that are constantly improving existing products and creating innovative new products.
- Kelsan's dedicated design engineering and production team use FEA analysis software to produce locomotive and customer specific delivery systems.

COMPLETE FRICTION CONTROL SOLUTIONS

Kelsan Technologies is not simply a product supplier. We are dedicated to providing our customers with comprehensive cost effective friction control solutions.....sustained solutions.

Our engineers partner with customers, freight locomotive and original equipment manufacturers to identify system challenges, measure baseline data, establish mutually acceptable performance criteria, and deliver pertinent solution. Kelsan's professional technical staff provides engineering services for product installation, systems maintenance, and long-term customer care. Following installation, Kelsan offers training seminars for vehicle and track personnel, and we conduct periodic after-sales system checks to ensure that system benefits are sustained.



EXCLUSIVE TECHNOLOGY PROVIDERS

Proprietary technology is the foundation of Kelsan's success. Our research and development team is constantly adding and improving its product line in order to continue bringing leading-edge friction control solutions to our freight customers.

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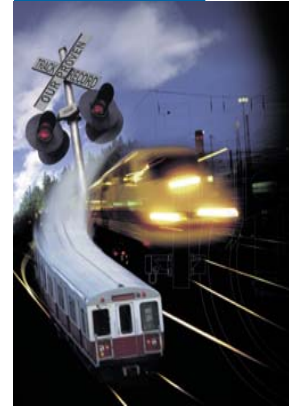
ISO 9001: 2000 CERTIFIED

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KELSAN TECHNOLOGIES CORP.

INNOVATIVE ThinFilm FRICTION CONTROL



Kelsan® Hi-Rail Solution

Intelligent Hi-Rail TOR Friction Control System

Kelsan® KELTRACK® Liquid Top-Of-Rail Friction Modifier
Portec Rail Road-Runner® 361 Hi-Rail™ Top-Of-Rail Application System

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Kelsan® delivers robust, integrated friction control solutions that offer freight locomotive authorities unprecedented power and flexibility in managing operational issues. The dynamics of the wheel/rail interface present a multitude of problems for Class I and Class II freight locomotive and shortline operators, from excessive noise to dangerous lateral forces which can cause costly locomotive derailments.

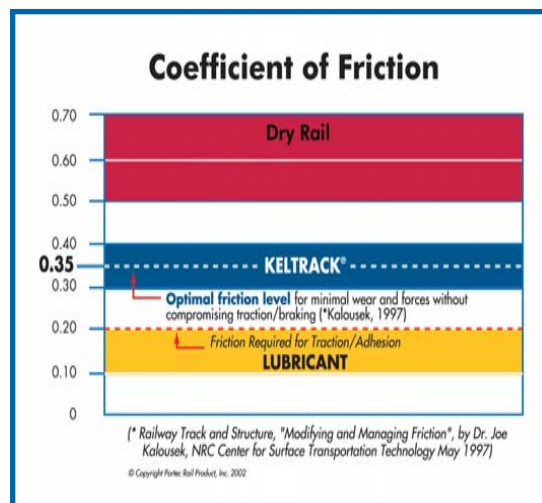
Kelsan® KELTRACK® is a proprietary, proven Top-Of-Rail (TOR) friction control product that is revolutionizing wheel/rail interface dynamics by reducing lateral forces, noise, and rail wear. The effectiveness of this product is well documented, and successfully implemented by leading edge Class I and Class II freight locomotive operators.



Kelsan® KELTRACK®, in partnership with Portec Rail Products Inc. ROAD-RUNNER® Hi-Rail™ TOR Application System, solves a number of key problems in the rail industry. This proprietary friction modifier and delivery equipment has been engineered to provide significantly reduced wheel squeal, lateral forces, rail wear, gauge widening, fuel consumption, and also reduce the risk of derailments without affecting the braking or signaling of the freight locomotives. Kelsan® KELTRACK® does this by maintaining the optimum intermediate coefficient of friction (0.35) eliminating any impact to braking, traction, and signaling.

What is Friction Control?

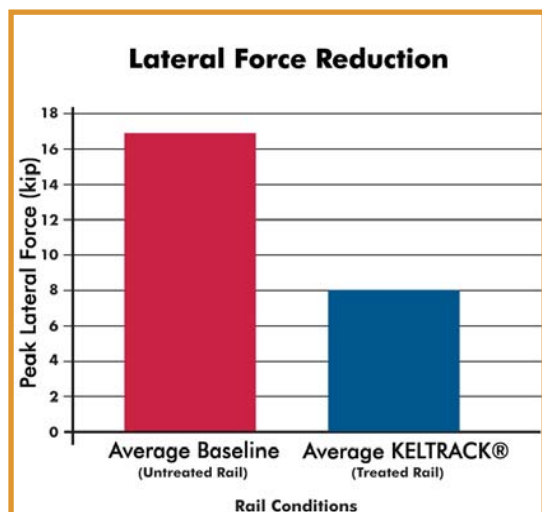
Kelsan® KELTRACK® is designed to provide an intermediate coefficient of friction on the top of the rail. It is water based liquid friction modifier that is applied directly to the top of rail. When the water evaporates, the material remains present as a thin, dry film. In contrast with standard lubricants (oil or grease), Kelsan® KELTRACK® has an intermediate coefficient of friction (0.35) which means it will not affect traction or braking. This intermediate friction level on the top of the rail is optimum for minimizing wear, energy and lateral forces in a safe and reliable manner.



LATERAL FORCE REDUCTION

Kelsan® KELTRACK® Hi-Rail using Portec Rail Products Inc. ROAD-RUNNER® Hi-Rail™ leaves a thin film of liquid friction modifier that quickly dries and leaves an optimum friction level on the top of rail. This optimum friction level reduces lateral forces caused by heavier axle loads, higher train speeds, and poor wheel conditions. As a result, 10° (175 meters) curves behave like 6° (291 meters) curves.

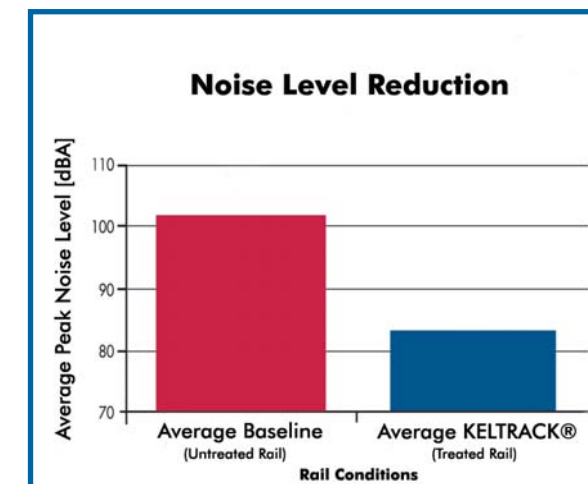
- Reduce lateral forces by up to 50%
- Reduce derailment potential
- Extend track structure component life



NOISE REDUCTION

Kelsan® KELTRACK® Hi-Rail and Portec's application system combine to deliver a highly effective noise reduction solution without impacting critical braking or signaling performance. Wheels experiencing lateral creep in curves are subject to roll slip oscillations as a result of the frictional characteristics of the interface layer between the wheel and rail. These roll slip oscillations are amplified in the wheel web leading to the familiar squeal as trains negotiate a curve. Noise reduction results have been achieved of up to 27 decibels. Eliminate the noise at its source.

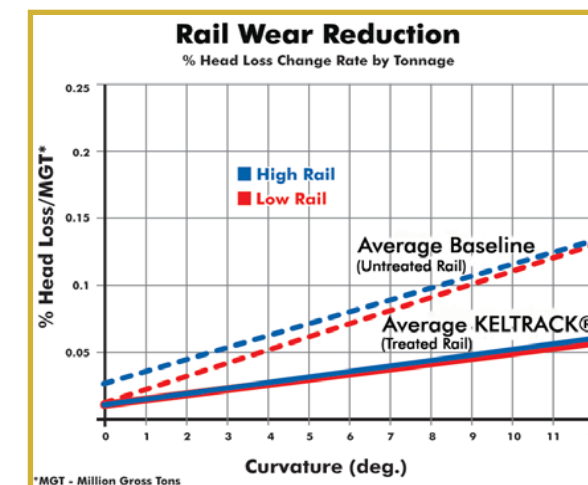
- Significant reduction in wheel squeal
- No effect on braking or signaling
- Environmentally friendly, non-toxic & non-flammable



RAIL WEAR REDUCTION

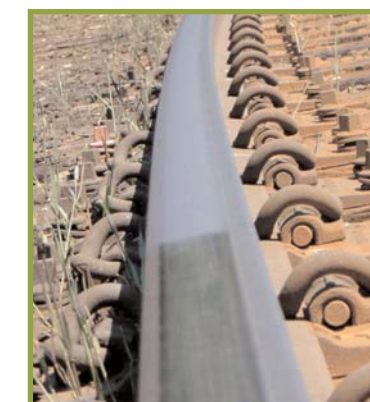
Kelsan® KELTRACK® Hi-Rail dramatically reduces lateral and flanging forces, thereby also reducing rail wear. Continuous application of KELTRACK™ improves truck steering and reduces flanging forces resulting in rail wear reduction of up to 50%.

- Reduce rail head area loss by up to 50%
- Defer costly rail replacement
- Improve truck steering
- Reduce gauge widening
- Reduce spike breakage
- Increase tie life



How is Kelsan® KELTRACK® applied?

In co-operation with Portec Rail Products Inc., Kelsan® KELTRACK® is applied using a model of the ROAD-RUNNER® HiRail TOR Application System. This is a standard HiRail truck customized to apply KELTRACK® to the Top of Rail using an atomized spray at the rear of the vehicle.



Nozzles sprays evenly across rail. Nozzles are configured to evenly cover the top of rail and do not migrate to the side of rail.